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ABSTRACT

Two articles in this issue are of interest to educators. "The Concept of Management" suggests that a manager should be concerned with four problems: 1) processing information; 2) setting and clarifying organizational goals; 3) behavior of his subordinates; and 4) establishing communications channels and integrative relationships between himself and other organizational elements to aid in conceptualizing and recycling the management process. The second article reports an experiment in using programed instruction on televised tape for a first course administration. Several groups heard the material, either in lecture form or on tape, and were tested on it. Rigorous statistical techniques were not used, but it appeared the students learned more via programed instruction. More testing is needed to determine the optimum size of the learning group in programed instruction. (JK)

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# ARKANSAS BUSINESS AND ECONOMIC REVIEW

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# Arkansas Business and Economic Review

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in the

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**FRONT COVER:**

ECONOMIC EDUCATION IN ARKANSAS—Participants in the 1971 Economic Education Workshop make their selection of a wide variety of materials available to classroom use. The Workshop was held during the summer on the University campus in Fayetteville.

Photograph courtesy The Arkansas State Council on Economic Education.

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Volume 4 Number 3 August 1971

# THE CONCEPT OF MANAGEMENT---------ANOTHER VIEW

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The average business man is unlikely to think of himself as a theorist. This may be due to the fact that he often divides ideas into those his common sense tells him will work ("practical") as opposed to those which in real life will not ("theoretical"). As in most things in life, this is an oversimplification, for to think in terms of theory is not to vacate common sense. Kurt Lewin recognized this when he is reported to have said that there is "nothing more practical than good theory", emphasizing the often overlooked definition of theory as "speculation" (which includes reflection, or thinking, along with the idea of prediction and its implied risk). Basically, theory includes both these aspects: 1) an integration or relationship of components into a more readily understood whole, and, 2) a basis for the prediction of future conditions. To the extent already discussed, this is a theoretical paper. It is concerned with both an integration of ideas and (hopefully) some reasonable basis for predictions.

Writers from a number of disciplines have observed that the understanding of complex human activity must be considered not only in light of individual variables that appear to bear on behavior, but also the relationships among these variables. This is readily demonstrated in such old standbys as Heredity and Environment. If

Behavior = f(Heredity, Environment)

we must take note of the possibility that a zero reading on one or the other will result in zero behavior. The implication is that the relationship between heredity and Environment is multiplicative since a simple additive relationship would not be as affected by the zero value. This idea of interaction among variables has long been recognized in biology, communications theory, systems analysis, and other areas. It finds one of its more lucid expositions in the field of General Systems Theory as espoused by von Bertalanffy (1968) and others. In this paper, we will attempt to follow the General Systems approach and describe management from a theoretical viewpoint as a dynamic process involving certain components or elements and their relation to one another. Our definition of management will be that it concerns the integration of elements or resources as related to organizational goals.

## COMPONENTS

The four elements which provide the basis for the concept of management to be presented here are:

Goals
Information
Manager
Operator

(It must be accepted that these words are not precisely defined and, in fact, in some cases actually overlap one another.)

An organization is assumed to have developed as a result of the actions of a number of individuals with their own personal interests and attitudes who band together to accomplish some common goal or goals. Thus a profit-making organization may result from the pooling of interests of a group consisting of: 1) a stockholder willing to risk money for a possible increase in the value of his investment; 2) a customer interested in a product or service he is unwilling or unable to develop himself; 3) a worker, willing to perform certain tasks for money and other rewards, and; 4) a manager, who performs somewhat different tasks for the same purpose. Some knowledge of these individual interests provides information of value in clarifying the common goals or organizational objectives.

Any organization is affected by the environment in which it exists and information regarding this environment becomes input to the organization itself. It should be noted that the goals or interests of individuals impinging upon the organization and those within the organization itself may be looked upon as additional information of concern to the organization. Some means must be provided for the processing of this changing pattern of information if the organization is to continually respond to its environment.

The information processing and coordinating agency of the organization may be referred to as the leader, administrator, or similar names. We choose to call him the MANAGER. The suggested definition of the manager as an integrator of resources, a slight bias toward the profit-making organization, and a common use of the word provides the principal argument for this designation. A similar argument influences the choice of name for the last element—the OPERATOR. While "group member" would be reasonable, we confess a bias in favor of a human element which suggests activity toward goal achievement, not at the coordinative level implied by the word "manager".

## RELATIONSHIPS

The GOALS-INFORMATION-MANAGER-OPERATOR pattern may be visualized in the simple diagram below:

Information is available to the system from the external environment in the form of data concerning the physical, social, economical and political world surrounding the organization. For simplifying purposes, it is assumed that through the same entry point information or any assumptions concerning goals of individuals, changes in the organizational goals, and facts regarding the changing picture of the operator's actions re-enters the pattern. INFORMATION thus includes data from both the external and internal environment of the organization.

The MANAGER initially is portrayed as an information processor who, acting on the input as interpreted by him, performs the function of translating information into organizational GOALS. Continuous attention to and re-evaluation of these goals is suggested by the feedback loop at the upper left of the diagram.

The manager also communicates with and gives directions to the OPERATOR, who is directly involved in the accomplishment of the organization's GOALS. Actions of the operator are communicated back to the manager as symbolized by the feedback loop at the bottom of the diagram. Comparison of operator actions and their effectiveness toward organizational goals is suggested by the two feedback loops. The scale depicted between the OPERATOR and the organizational GOALS is intended to convey the idea of measuring progress toward the organization's objectives.

## IMPLICATIONS

It has already been observed that a theory should provide 1) a means of integrating known data, and 2) a basis for prediction of outcomes. The concept presented here may be subjected to such a test.

One of the most common approaches to management thought is that which conceives of management as a process. The concept presented here is consistent with this view. One of the first functions performed by the MANAGER is to project ideas into the future (forecast) as a basis for setting GOALS and to choose between alterna-

tives (future actions) available to reach these goals. These notions are usually associated with the Planning function. The upper left feedback loop of the diagram presents an oversimplification of this process. Planning involves the elements of INFORMATION, the MANAGER, and GOALS, and by implication some consideration of possible (future) actions toward these goals as well as the reconsideration of these actions.

The function of Organizing emphasizes a division of labor (MANAGER-OPERATOR), communications, and relationships between positions and duties. In the case at hand, the MANAGER sets GOALS and performs planning functions, but the actions are actually completed by the OPERATOR. Both Organizing and Directing are suggested in the communications pattern through which the manager transmits instructions and receives new information concerning the actions of the OPERATOR.

Control is implied in the scale depicting a gap between the goals set by the manager, the directions issued to the operator, and the measurement of actual OPERATOR actions in comparison to the desired OPERATOR actions. Presumably, when the gap is closed the organizational goals have been achieved.

The concept does not make an obvious picture of the function of Motivating or Actuating as such. It may be observed, however, that this function is not readily clarified separate from the whole process of management. It may be postulated that the MANAGER and the OPERATOR, the two human elements, have a "built in" inclination to be continually active such that this capability for action must need only be effectively channelled by the proper selection and representation of organizational GOALS. It may thus be argued that the clarification of objectives or goals and proper communication of the value of these goals to the OPERATOR could serve to challenge the OPERATOR to action and in effect accomplish the motivation function.

The theory presented here is also consistent with the three-factor view of leadership which emphasizes that leadership is a function of an external situation in which a group exists, the leader, and the group itself. No convincing evidence is yet available to settle the question of whether leadership is a function of the actions of a single leader or a process conducted by all or some part of the group. In the present example, leadership is assumed to include goal clarification and structuring (establishing relations among) the members of the group. It may be differentiated from management primarily by the emphasis leadership places on human factors while management adds the consideration of other, often material, resources as well. The concept does not absolutely require that the MANAGER be a single person. It does suggest that one of the first actions of the MANAGER is that of INFORMATION processing and the conceptualization of organizational GOALS.

Since goals may not be "given" and must be either looked at from a new angle or in some cases invented, a measure of creativity is implied on the part of the MANAGER, in order to generate a list of possible goals, before the selection of the organizational GOAL or goals is made. A question may also be raised concerning how important simple problem-solving ability is in the MANAGER, whether an individual or a group is potentially more effective in this regard, and the related question of whether group action in the form of committee or conferences with their presumed interaction effect is of real value.

If the OPERATOR actually does share in the GOAL formation process (participative management) then a measure of objectivity may be lost when the control function is being performed. While the OPERATOR may not be in the best position to judge his progress toward the organizational GOALS unless he is also the MANAGER (completely participative management) who sets the goals, he may (if he is also the manager) not be the judge of whether he is doing a good job. This generates somewhat of a paradoxical situation. It may thus be argued that participation in the decision making process on the part of the OPERATOR may not be the unmixed blessing it is sometimes portrayed.

Any useful concept of management should be helpful in the development of hypotheses that may be subjected to further test. Some suggested by this concept follow below.

1) Most management action should begin first with an analysis of the external environmental factors, rather than a consideration of the internal affairs of the organization. The evaluation of internal factors will not be effectively accomplished until the environment in which the organization operates is defined. This may be stated as a rule of thumb to "Look first at the general economic and industry conditions."

2) Since any information system is imperfect, the MANAGER can rarely have all the possible information before he must make a decision. The MANAGER will thus be most effective who works to develop the skill of making decision with incomplete data. We may also add the corollary that some facts are more important than others—look for the "critical" factors that outweigh all others.

3) Since the same observations mentioned in 2) also apply to the OPERATOR, it may be observed that the efficiency of the entire operation (or OPERATOR output) is, to an important extent, a function of the MANAGER's ability to effectively communicate with the OPERATOR. Workers very possibly do not understand the desired (or desirable) performance of all parts of the organization (and in some circumstances may not care).

4) GOALS/objectives of any organization will (since they are set by the MANAGER) closely resemble the personal goals or standards of the MANAGER more than those of the OPERATOR. Problems may be expected to arise here since the OPERATOR (e.g., as a Union member) probably will not accept the same frame of reference as the MANAGER and, in fact, will probably be quite unsympathetic toward the MANAGER's problems and/or values.

5) If GOALS are not set by the MANAGER only short term or different goals will be assumed by the OPERATOR with confusion, conflict and minimal productive effort the result.

6) From an overall viewpoint, if any of the feedback nets are inoperative, the result will be aimless or uncoordinated activity. This may be manifest in poor planning or inappropriate action on the part of the manager. These same difficulties may also arise due to a lack of simultaneous or integrated study of all variables (i.e. Failure to look at the whole system).

## SUMMARY

The concept of management presented here suggests that the MANAGER is (or should be) concerned with problems of:

1) processing INFORMATION
2) setting and clarifying organizational GOALS
3) influencing the behavior of his subordinates (OPERATORS) and
4) establishing communications channels and INTEGRATIVE RELATIONSHIPS between himself and other organizational elements to aid in conceptualizing and recycling the management process.

Skills of considerable value to the manager would appear to include more creative problem-solving, communications ability, greater understanding of human relations and group aspects of organizational behavior, as well as a habitual thinking pattern which envisions a totality of resources. For maximum effectiveness, it would seem that the education of managers would stress more sophisticated problem-solving techniques, perhaps based both on general logic and greater use of computer and mathematical methods. For a deeper understanding of communications, aspects of human behavior and a greater consciousness of the interrelation of concepts, a search for usable knowledge from within all disciplines is increasingly important. The integration of this knowledge is probably the real test of any theory and of the manager who is ultimately responsible for its application to business problems.

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# SOCIOECONOMIC CHANGE AND PROBLEMS IN NORTH–CENTRAL ARKANSAS

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A recent study*of the rural open-country area of North-Central Arkansas provides timely information related to the broad problem of rural poverty and upon which existing programs, policies, and activities associated with the economic status of rural people may be better coordinated or directed to achieve the elimination of low-income and underemployment. Analytical attention centered on the twelve counties: Baxter, Boone, Carroll, Clebrune, Fulton, Izard, Madison, Marion, Newton, Searcy, Stone, and Van Buren. Information obtained in a 1956 survey of these twelve Ozark counties by the Agricultural Experiment Station and the Agricultural Research Service is compared to data generated in the present research effort in order to evaluate the socioeconomic adjustment of households left behind in the distressed rural area after several decades of high net out-migration of the population.

Of the 313 sample households in the rural open-country Ozark area, 1 in 2 are one- or two-member households, with one-half of these (28 percent) having retired household heads. Advancing age and the continued out-migration of youth have increased the ratio of people 65 years or older to those 20 to 49 years of age from 1 in 3 to 1 in 2 members. The economic and social significance of this change is related to the knowledge that income deprivation is clearly associated with age, and that, from an industrial development point of view, the 20 to 49 age group represents the better educated and more skilled members of the area's population.

Educational attainment generally remains at a relatively low level with little change, over the period of study, from the eight grade median for all persons fourteen years of age and older in 1956. While a high school education is considered necessary for effective employment, only 1 in 3 members of the sample reported this achievement. This, nevertheless, represents an important improvement over the 1 in 6 who were able to report a high school education in 1956.

A large number of family and individual characteristics are related to the level of living of rural people; so improvements here provide a good indication of improved socioeconomic status. The data revealed that housing conditions continued to improve. Of the 313 rural households, about 3 in 4 have hot and cold running water inside the structure today, compared with 1 in 2 sample households in 1956. Seventy percent have a bathroom, compared with about 50 percent earlier, and rural electrification now has reached 99 percent of the sample households, compared with only 70 percent in 1956. The household material and cultural possession aspects of level of living show the

*This study was funded by the Department of Agricultural Economics and Rural Sociology in the College of Agriculture at the University of Arkansas.

**The survey covered 12 counties designated by census officials as Economic Area 1 b.**

greatest improvements in household management items, thus reducing the burden of housework and releasing many women for employment.

Aggregate adjustment among the functional elements of the Ozark area economic base has produced a dynamic crossbreed of household economic types. The farm-nonfarm household, combining part-time farming with off-farm employment among its membership, has come to represent 1 in 3 of the sample households, compared with merely 7 percent in 1956. These households had more total earnings than did those who had only one major activity, and they had more total labor resources and earnings than either of the other groups. Farm-nonfarm households used their labor more completely and their return per unit of resource was higher than was that of the full-time commercial farm (1 in 20) and nonfarm households (1 in 6). Among the other household economic types, the combined forces of out-migration and industrial growth have resulted in the complete disappearance of the semi-employed household, (with less than four months of employment), having represented 16 percent of the 1956 sample households.

Since 1956, significant changes have taken place in the labor force activities and occupations of the Ozark area residents. Of the 750 individuals considered eligible for work activities, 412 reported work experience during the 12 months preceding the study. This represents a labor force participation rate of 55 percent, compared with approximately 70 percent for the nation generally.

The Ozark area labor force, which in 1956 had a 13 percent reservoir of migratory farm wage workers, now reveals only a 1 percent membership. Another noteworthy development is the increase in nonfarm workers from 2 in 5 to approximately 2 in 3 members of the labor force. While, in 1956, one-half of the working men and one-fourth of the working women did some nonfarm work during the year, two-thirds of the men and one-half of the women now report nonfarm work experience. Lumber-timbering, sawmilling, and the manufacturing of wood products, the single greatest source of nonfarm employment for Ozark area people 15 years ago, now has been surpassed by commerce, other manufacturing, and construction in order of importance.

The underemployment of rural open-country residents, although greatly improved, still handicaps economic adjustments in the Ozark area. Household heads who were ordinarily in the labor market for the full year averaged below the 260-day full-employment level. However, the 250 days for males and 240 days for female breadwinners is far better than the 190-day average each reported in 1956.

Improvements in the type and scale of farming enterprises have reduced seasonality and improved the utilization of family labor. While members of the 1956 labor force engaged in farming operations averaged only 166 days of work, today they report an average of 195 days, which may be very close to full-employment, if one recognizes the diversified economic activities of hill farmers.

The shifting of approximately 10 percent of the labor force from farm to nonfarm employment over the period of study may have had some effect on the relatively little improvement in duration of employment for nonfarm workers. Workers reporting nonfarm employment in 1956 averaged 231 days, compared with 255 days in the present sample.

Although the underemployment problem in the Ozark area is being solved by the development of local industry and the out-migration of the population, more than one-half of the labor force remains underemployed, with a median duration of employment of 247 days.

The improved underemployment condition of Ozark area workers has its logical consequences in improved household and personal incomes. Farm households with their high degree of underemployment have the lowest average household income at $3,800. This, however, represents a 40 percent increase in real income over the 15 year period. Nonfarm households realized a 54 percent increase in average real household income, from $2,425 in 1956 to $5,908 in the present study. The average real income for nonwork households is $2,259, compared with $851 earlier; this represents a 67 percent increase. The farm-nonfarm household ranks first in average real income at $6,724, compared with $2,061 in 1956, for a 106 percent gain.

Approximately 2 in 3 households reported receiving some, if not all, of their income from nonwork sources, compared with 1 in 2 families in 1956. One-half of the families receiving nonwork income were receiving social security benefits and another 25 percent of these families received state welfare and old age assistance.

The low-income conditions for Ozark families is far from being solved. Thirty-three percent of the households interviewed had incomes below the $3,000 poverty line for a two-member family. The use of this figure, however, tends to understate the poverty conditions in rural areas where larger families are generally the norm. A more meaningful classification scheme that is based on household size employs the criteria shown in Table A[1].

The results of applying these criteria in the present study are reported in Table B. After household incomes are reduced to a comparable basis, 3 percent of the sample households are classified as seriously deprived, 12 percent are classified as definitely deprived, add 25 percent as marginally deprived. Thus, 40 percent of the Ozark area households, rather than one-third, continue to suffer from the income deprivation effects of rural poverty.

Individual earnings for both male and female nonfarm workers remain low. Male labor force participants averaged $3,390 and female nonfarm workers received $2,833. These figures may be compared with the $4,870 average annual earnings of workers throughout the state of Arkansas in 1969.[2] Although individual earnings are still low today, they represent a substantial improvement over the $957 and $693 average for male and female nonfarm workers in 1956.

The cash incomes of farm households average $3,821 during 1969, compared with $1,711 in 1955. This increase is due primarily to the changing nature of farm enterprise in which livestock production—especially broilers and cattle—has replaced much of the dairy farming and nearly all of the crop production among area farmers. Also, the increased demand for beef and broilers has sharply increased price levels in these areas of production.

Household financial status has changed very little over the years. The use of credit by area residents remains unchanged at 2 in 5 households, although 1 in 4 households report mortgages. Improved incomes for area households has led to substantial changes in the number of households reporting increased savings in the past year. Although 1 in 3 households still have no savings, the number with greater resources has increased from 6 percent to 28 percent.

Home produced and consumed products still play an important part for rural open-country households in supplementing family incomes. At approximately $270 per household, there has been no change since 1956, although family incomes have improved greatly.

Of the families interviewed, 146 or 47 percent live on places that meet the current United States Census definition of "Farms". One-half of these were considered commercial farms in terms of their sales. The other one-half represent part-time and merely residential farms.

While the number of farms has decreased over the years, farm size has increased by approximately 10 acres to an average of 185 acres today. In terms of land use, land is shifting away from crop production, except for hay crops, and into improved pasturelands. In 1956, 97 percent of the farmers interviewed reported the production of crops; in the present sample, only 66 percent reported crops.

Farm cash incomes of over $2,500 were reported by only 1 in 5 farmers in 1956, compared with 1 in 3 in the present sample after adjusting for price changes. The number of low income commercial farms has greatly improved over the period of study. Farmers reporting $250 to $1,999 cash income accounted for 20 percent of the full-time farmers in 1956, compared with merely 3 percent today.

When farm practices and farm mechanization are rated on a potential to actual use index scale, the improved nature of farm operation in the Ozark hills becomes apparent. Farmers interviewed in 1956 scored 1.9 on the farm practices index and 3.3 on the farm mechanization index. Today, however, sample data lead to a score of 5.1 for practices and 9.6 for farm mechanization. These improvements are related to improved agricultural contacts on the one hand, and improved income on the other.

**Table A**

**Criteria for Establishing Relative Income Deprivation Based on Household Size**

| | Household size income class and description of deprivation level | | | | | |
|---|---|---|---|---|---|---|
| Household Income | 1<br>Serious | 2<br>Definite | 3<br>Marginal | 4<br>Probably not | 5<br>Definitely not | 6<br>Undetermined |
| | Number of persons in household | | | | | |
| Under $1,000 | 2 or more | 1 | | | | |
| $1,000 to $1,999 | 5 or more | 2,3, or 4 | 1 | | | |
| $2,000 to $2,999 | 9 or more | 4 to 8 | 2 and 3 | 1 | | |
| $3,000 to $4,999 | | 8 or more | 4 to 7 | 2 and 3 | 1 | |
| $5,000 to $7,999 | | | 9 or more | 4 to 8 | 1 to 3 | |
| $8,000 to $9,999 | | | | 6 or more | 1 to 5 | |
| $10,000 and over | | | | 9 or more | 1 to 8 | |
| Not reported | | | | | | Any |
| Refusal | | | | | | Any |

**Table B**

**Number of Households, by Household Income-Size Class in the Arkansas Ozark Area, 1970**

| | Degree of deprivation | | | | | |
|---|---|---|---|---|---|---|
| Household Income | Serious | Definite | Marginal | Probably not | Definitely not | Undetermined |
| | Number of households | | | | | |
| Under $1,000 | 7 | 5 | | | | |
| $1,000 to $1,999 | 0 | 28 | 15 | | | |
| $2,000 to $2,999 | 1 | 4 | 39 | 3 | | |
| $3,000 to $4,999 | 0 | 2 | 22 | 41 | 5 | |
| $5,000 to $7,999 | 0 | 0 | 3 | 42 | 49 | |
| $8,000 to $9,999 | 0 | 0 | 0 | 0 | 21 | |
| $10,000 and over | 0 | 0 | 0 | 0 | 26 | |
| All households (313) | | | | | | |
| Number | 8 | 39 | 79 | 86 | 101 | 0 |
| Percent | 3 | 12 | 25 | 28 | 32 | 0 |

While approximately 20 percent of the open-country residents were dependent on agriculture alone in 1956, today only 5 percent make their living by farming.

This article has attempted to show and describe the changing economic base of the Ozark area, its gradual shift from agriculture to industrial and commercial activities, and the continuing related problem of underemployment and income deprivation among many of the area's households and people. Today, the Ozark area continues to rank low in the state and nation in the education and lack of marketable skills available among its labor force. Also, years of out-migration of its youth and the increasing age of its residual residents have produced an adverse age composition among the present population that may severely retard the development of economic activities in years to come. Nevertheless, economic readjustment has produced several favorable aspects: (1) reduction of surplus labor in relation to area resources, (2) expansion of nonfarm employment, (3) reduction of underemployment, (4) development of the farm-nonfarm family type compromising poor farming conditions and low nonfarm wages, (5) specialization in farming enterprises in livestock production, and (6) the movement to the area of retired people with improved retirement incomes.

## FOOTNOTES

[1]Adapted from: Jackson V. McElevenn, Characteristics of Human Resources in the Rural Southeast Coastal Plain . . . With Emphasis on the Poor (Washington: U.S. Government Printing Office, 1969), Agricultural Economic Report No. 155, 15-16.

[2]Arkansas Department of Labor, Employment Security Division, Average Weekly Earnings, 1969 (Little Rock: Arkansas Department of Labor, 1970), Tables I and III.

# MALE AND FEMALE INCOME DIFFERENTIALS——————

# A CASE OF ARKANSAS

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This study is an attempt to explain through a macro model the incomes of males as well as females as explained by five population characteristics in each county in the state of Arkansas. The five characteristics which explain the median income of each sex in each county are 1) age and color, 2) educational level, 3) level of active labor force, 4) employment status, and 5) level of underemployment. Using regression analysis, the contribution of each of these factors towards income is determined for the male as well as for the female population. A comparison of the estimates for the contributions by the male factors with each of the corresponding female factors measures the extent of sex discrimination.

## THE MODEL

In each county, the median income for each sex is assumed to be a linear function[1] of the indices of 1) age-color, 2) educational level, 3) level of active labor force, 4) employment status, and 5) level of underemployment. These indices are explained in detail in the following sections of this paper. Specifically the function is

$$Y_c = a + b_1x_{1c} + b_2x_{2c} + b_3x_{3c} + b_4x_{4c} + b_5x_{5c} + e$$

where $Y_c$ is the actual median income for the $c$-th county, a is the constant term, b's are the coefficients associated with the corresponding indices, $x_{1c}$, $x_{2c}$, $x_{3c}$, $x_{4c}$, and $x_{5c}$ are respectively the indices for the five characteristics noted above, and e is the error term. According to theory, one would expect the first four coefficients to be positive in all cases, since each should make some incremental contribution to income received. The last coefficient, $b_5$, should always be negative since more underemployment should be associated with lower incomes.

## DATA

Data used in this study consist of the 1960 population characteristics for the 75 counties of Arkansas. These data are taken from Kampe and Lindamood[2] and a complete explanation of the procedures followed in the data computation can be found there.[3] A brief description of these data is given in the following paragraphs.

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*The authors are Associate Professor of Economics and graduate student respectively at Ohio University. They are grateful to Professor Burton DeVeau for bringing these data to thier attention.

For each county, an index for each of the characteristics has been calculated. Each index reflects the capacity of that county's population to produce income as compared to the income that would have been obtained if the same population characteristics had occurred at the national level. Briefly, the indices are as follows:

**Age and Color Index**

The percentage distribution according to age and color for the United States and each county is weighted by the U.S. median income corresponding to that particular age-color group. The summation of these products for the U.S. (white and non-white) yields the approximate U.S. median income for each sex. Similarly the summation of these products for the county gives an estimate of the county median income that would have been earned if that age-color mix would have existed at the national level. The ratio (expressed as a percentage) of the estimated county median income to the U.S. median income for each sex is the county's index for age and color. Thus for each sex:

$$x_{1c} = \frac{\Sigma A_{iwn}\, Y_{iwu} + \Sigma A_{inc}\, Y_{inu}}{\Sigma A_{iwu}\, Y_{iwu} + \Sigma A_{inu}\, Y_{inu}} \times 100.0$$

where $A_{iwc}$ is the percent of the $\underline{w}$-th (white) population in the $\underline{i}$-th age category in the $\underline{c}$-th county and $Y_{iwu}$ is the income of the $\underline{w}$-th group in the $\underline{i}$-th age category in the $\underline{u}$-th (U.S.) group. $A_{inc}$ and $Y_{inu}$ refer to the $\underline{n}$-th (non-white) group. All values in the denominator refer to the $\underline{u}$-th (United States) group. If, for example, a county's age and color distribution was such that its income producing capacity was less than the national median, the resulting index would be less than 100. It might be pointed out that this index is the only one in which a color adjustment is made.

**Educational Level**

This index is based upon the level of education attained by those 25 years old and over and is calculated as follows:

$$x_{2c} = \frac{\Sigma E_{ic}\, Y_{iu}}{\Sigma E_{iu}\, Y_{iu}} \times 100.0$$

where $E_{ic}$ is the percent of the population who have completed the $\underline{i}$-th year of schooling in the $\underline{c}$-th county and $Y_{iu}$ is income received by the $\underline{i}$-th group on the $\underline{u}$-th level. Again all figures in the denominator refer to the $\underline{u}$-th (United States) group.

**Level of Active Labor Force**

This index is calculated in the same way as the above and is based on labor force participation of those 14 years old and older receiving incomes. Thus:

$$x_{3c} = \frac{L_c\, Y_{1c} + NL_c\, Y_{nlu}}{L_u\, Y_{1u} + NL_u\, Y_{nlu}} \times 100.0$$

where $L_c$ is the percent of the population in the labor force in the $\underline{c}$-th county and $Y_{1u}$ is the income received by those in the labor force in the $\underline{u}$-th group. $NL_c$ is the percent of population not in the labor force in the $\underline{c}$-th county and $Y_{nlu}$ is the income received by those not in the labor force in the $\underline{u}$-th group.

**Employment Status**

A similar index is made on the basis of civilian employment, civilian unemployment, or employment in the armed forces. Thus:

$$x_{4c} = \frac{\Sigma S_{ic}\, Y_{iu}}{\Sigma S_{iu}\, Y_{iu}} \times 100.0$$

where $S_{ic}$ is the percent of population in the $\underline{i}$-th employment status group in the $\underline{c}$-th county and $Y_{iu}$ is the income received by those in the $\underline{i}$-th category in the $\underline{u}$-th group.

**Underemployment Index**

After the first four indices are computed, they are multiplied together to obtain a combined index which in turn is weighted by the national median income. This index thus becomes a measure of the county's median earning capacity or "required median income." The ratio of the actual county median income to the "required median income" measures the extent to which the county labor force is utilized. To obtain the rate of underemployment, this index is subtracted from 100. If the difference is positive, the county is considered underemployed. A negative difference indicates that the county's labor is being utilized more effectively than comparable labor in the county as a whole. Finally the county underemployment is expressed in man-years by multiplying the rate of underemployment by the number of employed civilians in the county labor force. Thus the underemployment index is defined as:

$$x_{5c} = 100 - \frac{Y_c}{Y_u} \cdot \frac{100}{x_{1c}} \cdot \frac{100}{2_{2c}} \cdot \frac{100}{x_{3c}} \cdot \frac{100}{x_{4c}} \cdot CL_c$$

where $Y_c$ is the actual median income of the $c$-th county, $Y_u$ is the actual U.S. median income, and $CL_c$ is the size of the civilian labor force in the $c$-th county.

## EMPIRICAL RESULTS

Model (1) is fitted to the data using the multiple regression technique. Table I summarizes the linear regression results for the state of Arkansas both for males and females.[4] Table I gives coefficients for the five characteristics, constant term, $\bar{R}^2$ the square of the coefficient of multiple correlation adjusted for degrees of freedom, and F-ratio. The figures in parentheses below the coefficients are the t-values to test the significance level of the coefficients.

The fitted functions explain about 98 percent of the variations in the various counties of the state of Arkansas. Furthermore, all the coefficients are statistically significant. As expected the first four coefficients (i.e., $b_1$, $b_2$, $b_3$, and $b_4$) are all positive, while $b_5$, the underemployment coefficient, is negative.

The results in Table I suggest that, with regard to the age-color index alone, the increments to a county's male income are slightly more than twice that of the female income. In absolute terms, the improvement of the males' age-color index *ceteris paribus* by one unit would add $19 to the median male income. A similar improvement of one unit in the female index would add less than $7 to the female's median income.

Similarly, the increments to the male income for educational attainment, labor force level, and employment status would be approximately $23, $26, and $22 respectively. For females, the additions would be approximately $9, $7.50, and $11, in that order. The coefficient for underemployment indicates that if a county's male labor were to be utilized more fully (thus lowering its underemployment index) by a factor of one unit, the addition to male median income would be about $34. The same one unit decrease in the female underemployment factor would increase the female income by only about $11. These figures suggest that a similar improvement in female characteristics contributes to incomes by less than half that which would be added to male incomes. This is an indication of the extent of sex discrimination.

**Table I**

| | Constant | Coefficients | | | | |
|---|---|---|---|---|---|---|
| | | $b_1$ | $b_2$ | $b_3$ | $b_4$ | $b_5$ |
| Male | | | | | | |
| | -5304.74 | 19.0120 | 23.1128 | 26.2471 | 22.2253 | -33.6019 |
| | | (14.39) | (13.17) | (10.37) | (3.54) | (33.96) |
| | $\bar{R}^2$ = .9846 | | | F-ratio = 947.34 | | |
| Female | | | | | | |
| | -2203.88 | 6.7888 | 9.2129 | 7.5572 | 11.2526 | -10.7970 |
| | | (15.85) | (14.28) | (12.76) | (5.15) | (23.96) |
| | $\bar{R}^2$ = .9699 | | | F-ratio = 478.59 | | |

Table 2 shows the ratios of the male coefficients to the female coefficients for Arkansas.

**Table 2**

| Coefficients | |
|---|---|
| $b_1$ | 2.80:1 |
| $b_2$ | 2.51:1 |
| $b_3$ | 3.47:1 |
| $b_4$ | 1.98:1 |
| $b_5$ | 3.11:1 |

In 1960 in Arkansas, the overall income ratio was 2.66:1 ($1850 for males compared to $695 for females). The corresponding ratio for the U.S. as a whole was 3:1. The ratios for California, Ohio, New York, Mississippi, Alabama, and Arizona are given in Table 3.[5]

This suggests that sex discrimination in Arkansas is at a lower level compared to the country as a whole. In Arkansas, the greatest discrimination appears to be related to the female labor force level. This might be due to the fact that the returns from employment are so low that many females do not consider it worthwhile to take a job. Similarly, the discrimination factor for education suggests that for women it is not worthwhile to invest on education.

## CONCLUSIONS

The above results indicate that underemployment is the most significant factor contributing to the income differentials in the various counties of Arkansas. For policy this analysis suggests that the state or federal governments can help to narrow the income disparities by providing additional employment opportunities in those counties where the underemployment is high. For males, the level of active labor force coefficient ($b_4$) would yield the next highest return per unit, all other factors being equal. These would be followed by the educational level, employment status, and age-color factors. For females, the underemployment would be followed by employment status, education level, level of labor force and age-color. However, it is difficult to improve the educational levels or the age and color mix in the short run. On the basis of our estimated income functions, the disparity between male and female incomes would be substantial even if all labor were utilized on a par with national norms (i.e., underemployment for both sexes zero). This also partly explains that there is no incentive for the female population to receive the same level of education as the male population. A further study is needed to find the causes of income disparities between sexes.[6]

**Table 3**

| | COEFFICIENTS | | | | |
|---|---|---|---|---|---|
| | $b_1$ | $b_2$ | $b_3$ | $b_4$ | $b_5$ |
| Ohio | 3.85:1 | 3.71:1 | 3.53:1 | 1.87:1 | 2:83:1 |
| New York | 3.17:1 | 2.96:1 | 3.21:1 | 3.16:1 | 3.06:1 |
| California | 2.73:1 | 3.47:1 | 3.27:1 | 1.13:1 | 2.85:1 |
| Mississippi | 2.31:1 | 2.40:1 | 2.94:1 | 2.63:1 | 2.89:1 |
| Alabama | 1.13:1 | 2 0.75:1 | 3.04:1 | 1.74:1 | 8.93:1 |
| Arizona | 3.48:1 | 3.39:1 | 3.60:1 | 1.41:1 | 2.89:1 |

## REFERENCES

1. We have also tried the log-linear formulation but the fit is not good.

2. Kampe, R.E. and Lindamood, W.A., Underemployment Estimates by County, United States, 1960, Agricultural Economic Report No. 166, Economic Research Service, United States Department of Agriculture, Washington D.C., 1969.

3. IBID. pp. 1-6. A less detailed account of the procedures employed can also be found in Williams and Glasgow, "Developing Estimates of Economic Underemployment for the Rural Labor Force of Seven Southern States," American Journal of Agricultural Economics, December 1968, pp. 1432-36.

4. The log-linear results are as follows:

| | Male | Female |
|---|---|---|
| Constant | - 0.39 | - 4.53 |
| Coefficients | | |
| $b_1$ | 0.5479 (4.22) | 0.9796 (13.56) |
| $b_2$ | 1.3856 (8.46) | 1.1468 (11.50) |
| $b_3$ | 0.8494 (3.23) | 0.7725 (8.26) |
| $b_4$ | - 0.5553 (0.94) | 1.1318 (2.50) |
| $b_5$ | - 0.4290 (15.34) | - 0.3745 (17.83) |
| | $\overline{R}^2$ = .9242 | $\overline{R}^2$ = .9497 |
| | F ratio = 181.42 | F ratio = 280.21 |

5. So far we have estimated the functions for these states; however, a further study is underway to examine these ratios for other states.

6. A recent study suggests that there are no significant differentials for male and female on intra-establishment basis, whereas, these differences are significant on inter-establishment basis. See: Donald J. McNulty, "Differences in Pay Between Men and Women Workers," Monthly Labor Review, December 1967, pp. 40-43.

# A TEACHING INNOVATION IN PROGRAMMED INSTRUCTION ON TELEVISED TAPE FOR THE FIRST COURSE IN BUSINESS ADMINISTRATION

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## I. Objectives of the Innovative Program

Since 1961 the author has been involved in developing and testing written programmed instruction in concepts of business administration, culminating in the first ever published written programmed instruction workbook for an Introduction to Business course (published in 1968 by Holt, Rinehart, and Winston).

In 1968-69 the author and a team of his graduate students* started to innovate in taped television programmed instruction. It was felt that this new teaching methodology would be a pioneering effort in inter-relating programmed instruction and individual closed circuit television. The objectives of this experimentation were as follows:

1) to improve the quality of teaching of the first course in business administration;

2) to reduce the costs of teaching this first course; and

3) to improve the educational standards of this first course in business administration to make it meaningful to students.

All of these objectives were directed toward helping students get a better quality education with less cost to the educational institution.

## II. Summary Description of the Innovation

Our plan for the selection and use of the subject matter and the subsequent development of a televised audio-video tape was coordinated in the following manner.

**Phase I.** The initial phase of our project consisted of a search for feasible subject matter which could be adapted for use in a televised audio-video programmed instruction tape. We decided to program the first chapter of the author's book, Introduction to Business. This chapter is entitled "America's High Standard of Living and the Free Enterprise System." More specifically, we decided to program in televised form the concepts in written form in the first lesson of the programmed workbook which accompanies the Introduction to Business book.

**Phase II.** As we procured and assembled the necessary material for our project, we made arrangements for the technical television assistance we would later need in filming the program. Since our project team selected a previously written lesson, this phase of our project involved

*Gordon Dodson, Joe Singer, and William Anthes, all doctoral candidates.

the rewriting of several frames so that the responses would appear very close to the end of the stimulus statement. This is one of the very important aspects of audio presentation since the student has no opportunity to review the material as he does in written programs. After a process of discarding, or rewriting, we put together a paste-up of our script and then developed the flow of presentation by writing the necessary interconnecting statements and student directions.

**Phase III.** This phase of our innovation involved the creation and reproduction of student response materials and the development of video cards to emphasize parts of the audio program. Video cards may simply show phrases or entire frames as well as charts and diagrams to cue the student in his responses.

**Phase IV.** In this phase of our program, we practiced the delivery of the audio attempting to smooth out the basic flow of ideas while determining the points at which a video card would appear in the program. Additional cards were prepared to complete the coordination of the audio and video and several more days were spent in experimenting with the presentation of the full program.

**Phase V.** After fully rehearsing the presentation, an "initial" tape was televised and we proceeded to self-test the timing of the presentation with the student responses. We carefully noted those aspects which would require a correction in preparing the final "master" tape.

**Phase VI.** In this phase of our project, we prepared a final master tape and designed a terminal post test to accompany the program.

**Phase VII.** In testing our program we selected various groups of students (freshmen-sophomores) to view the tape and take the examination over the material covered. In an attempt to compare results, another group of students was subjected to a lecture over the same material which was again followed by the same examination. (The results of these tests are contained in section three of this report.)

**Phase VIII.** The evaluation and reporting phase of our project actually began with the initial assignment of our project and consisted of varied oral and written evaluations of the various phases of the project. In the very early months of the project very close supervision was necessary in order to clarify and evaluate goal accomplishment.

## III. Report of Experimentation With the Innovative Program

The following information is presented regarding the groups of students who viewed the televised programmed instruction tape and took the tests.

Group 1 — Graduate students who experimentally viewed the tape and took the first test.

Group 2 — Freshmen students in a class to whom material was presented in lecture form and tested.

Group 2B — Same freshmen students who took the same test five days after the first test.

Group 3 — Freshmen students who voluntarily viewed the program and took the test.

Group 3B — Same freshmen who took the same test five days after the first test.

Group 4 — "Small" size group of volunteers.

Group 5 — "Late afternoon" group of freshmen who did the program.

Group 5B — Same "late afternoon" group who took the test after five days.

### GROUP 1 --- GRADUATE STUDENTS

| STUDENT | SCORE | | |
|---|---|---|---|
| 1 | 100 | Graduate | YES |
| 2 | 100 | Undergraduate | NO |
| 3 | 100 | Tape | YES |
| 4 | 100 | Lecture | NO |
| 5 | 100 | Response Sheet | YES |
| 6 | 100 | Mean | 97.9 |
| 7 | 100 | Median | 100 |
| 8 | 100 | Mode | 100 |
| 9 | 100 | Standard Deviation | 3.79 |
| 10 | 95 | Percentage of students | 100 |
| 11 | 90 | scoring ninety (90) | |
| 12 | 90 | percent or above | |

**COMMENTS:**

This group consisted of graduate students in Business Administration at the University of Arkansas enrolled in Organization Theory and Principles of Administration. There were both MBA and Ph.D. candidates in the group.

The measures of central tendency calculated all yield very high values. The standard deviation, the only measure of dispersion calculated, was the smallest of the four groups tested. These facts are further supported when it is shown that 100 percent of the students scored 90 percent or better on the exam. These students had seen the same material, in different form, earlier in the semester.

**GROUP 2 – FRESHMEN ENROLLED IN A CLASS (LECTURE GROUP)**

| STUDENT | SCORE | | |
|---|---|---|---|
| 1 | 95 | Graduate | NO |
| 2 | 95 | Undergraduate | YES |
| 3 | 90 | Tape | NO |
| 4 | 90 | | |
| 5 | 90 | Lecture | YES |
| 6 | 85 | | |
| 7 | 85 | Response Sheet | NO |
| 8 | 80 | | |
| 9 | 80 | | |
| 10 | 80 | | |
| 11 | 75 | Mean | 71 |
| 12 | 70 | | |
| 13 | 70 | Median | 70 |
| 14 | 65 | | |
| 15 | 65 | Mode | 65 |
| 16 | 65 | | |
| 17 | 65 | Standard Deviation | 15.3 |
| 18 | 65 | | |
| 19 | 60 | Percentage of students scoring ninety (90) percent or above | 20 |
| 20 | 55 | | |
| 21 | 55 | | |
| 22 | 55 | | |
| 23 | 50 | | |
| 24 | 50 | | |
| 25 | 40 | | |

**COMMENTS:**

The group consisted of freshman students registered for the second semester of the course, American Economic Development. They did not see the tape but heard an hour lecture on the same material. They were told that a short quiz would be given on the material after the lecture.

An array of the grades indicates a wide range of scores, from 95 down to 40. The existence of five scores above 90 percent indicate that the lecture was not a poor lecture. By being attentive and thinking about the material a student could obtain a "passing" grade.

The measures of central tendency are all lower than similar measures for groups viewing the tape. The standard deviation is the highest of the four groups tested. Only 20 percent of students taking the exam scored 90 percent or above.

**GROUP 2B**

| STUDENT | SCORE | | |
|---|---|---|---|
| 1 | 95 | Graduate | NO |
| 2 | 95 | Undergraduate | YES |
| 3 | 90 | Tape | NO |
| 4 | 80 | | |
| 5 | 80 | Lecture | YES |
| 6 | 75 | | |
| 7 | 70 | Response Sheet | NO |
| 8 | 70 | | |
| 9 | 65 | | |
| 10 | 65 | | |
| 11 | 60 | Mean | 63 |
| 12 | 60 | | |
| 13 | 55 | Median | 60 |
| 14 | 55 | | |
| 15 | 55 | Mode | 55 |
| 16 | 55 | | |
| 17 | 45 | Standard Deviation | 17.05 |
| 18 | 45 | | |
| 19 | 40 | Percentage of students scoring ninety (90) percent or above | 14.2 |
| 20 | 40 | | |
| 21 | 40 | | |

**COMMENTS:**

This group is the same as Group 2. The test results are, however, the result of a test given five days later. The test was exactly the same as the one given previously.

The measures of central tendency and the standard deviation both show that retention of the material is poor. The mean, median, and mode all decreased while the standard deviation increased. The number of students scoring 90 percent or above also decreased.

## GROUP 3 -- VOLUNTEER FRESHMEN (PROGRAMMED GROUP)

| STUDENT | SCORE |
|---|---|
| 1 | 100 |
| 2 | 100 |
| 3 | 100 |
| 4 | 100 |
| 5 | 100 |
| 6 | 100 |
| 7 | 100 |
| 8 | 100 |
| 9 | 95 |
| 10 | 95 |
| 11 | 95 |
| 12 | 95 |
| 13 | 95 |
| 14 | 90 |
| 15 | 90 |
| 16 | 90 |
| 17 | 85 |

| | |
|---|---|
| Graduate | NO |
| Undergraduate | YES |
| Tape | YES |
| Lecture | NO |
| Response Sheet | YES |
| Mean | 95.9 |
| Median | 95 |
| Mode | 100 |
| Standard Deviation | 4.61 |
| Percentage of students scoring ninety (90) percent or above | 94 |

**COMMENTS:**

The group consisted of volunteer students at the freshman level in the College of Business Administration at the University of Arkansas.

The mean, median, and mode are all "high". The standard deviation is "low" as is the range. The percentage of students scoring above ninety (90) percent was 94.

When compared with Group 2 it can be concluded that tape instruction resulted in higher test scores and a smaller standard deviation and range.

## GROUP 3B

| STUDENT | SCORE |
|---|---|
| 1 | 100 |
| 2 | 100 |
| 3 | 95 |
| 4 | 95 |
| 5 | 90 |
| 6 | 85 |
| 7 | 85 |
| 8 | 85 |
| 9 | 85 |
| 10 | 80 |
| 11 | 80 |
| 12 | 75 |
| 13 | 75 |
| 14 | 70 |

| | |
|---|---|
| Graduate | NO |
| Undergraduate | YES |
| Tape | YES |
| Lecture | NO |
| Response Sheet | YES |
| Mean | 86 |
| Median | 85 |
| Mode | 85 |
| Standard Deviation | 9.05 |
| Percentage of students scoring ninety (90) percent or above | 36 |

**COMMENTS:**

This group is the same as Group 3. The test results given are for an identical test given six days after the first test.

Retention of the material has dropped but the measures of central tendency remain in the eighties. The standard deviation and range have both increased. Although the number of students making 90 percent or better decreased from 94 percent to 36 percent, 79 percent of the students still made above 80 percent. This would indicate that some low "A" students have dropped to "B" students.

## GROUP 4 – "SMALL SIZE" GROUP

| STUDENT | SCORE | | |
|---|---|---|---|
| 1 | 95 | Graduate | NO |
| 2 | 95 | Undergraduate | YES |
| 3 | 95 | Tape | YES |
| 4 | 95 | | |
| 5 | 90 | Lecture | NO |
| 6 | 80 | | |
| 7 | 30 | Response Sheet | * |

*Indicates no response sheet; others in the group used the response sheet.

**COMMENTS:**

This group was an experiment with a small group viewing the tape. We wanted to test to see if the size of the group influenced student learning. An experiment was also made to see if tape instruction was better with a response sheet or without it.

The results were, to an extent, inconclusive. There were no perfect test papers by any of the members of the group. However, the results in terms of test scores, do indicate that viewing the tape does tend to aid the educational process.

In terms of the size of group inconclusive results were again obtained. More will be said on this topic in the conclusions section of the statistical analysis.

It might be pointed out that the student with the extremely low score of 30 did not use a response sheet and slept periodically through the tape.

## GROUP 5 – "LATE AFTERNOON" GROUP OF FRESHMEN

| STUDENT | SCORE | | |
|---|---|---|---|
| 1 | 100 | Graduate | NO |
| 2 | 100 | | |
| 3 | 100 | Undergraduate | YES |
| 4 | 100 | | |
| 5 | 95 | Tape | YES |
| 6 | 95 | | |
| 7 | 95 | Lecture | NO |
| 8 | 95 | | |
| 9 | 95 | Response Sheet | YES |
| 10 | 95 | | |
| 11 | 90 | | |
| 12 | 90 | | |
| 13 | 85 | Mean | 93 |
| 14 | 80 | Median | 95 |
| 15 | 80 | Mode | 95 |
| | | Standard Deviation | 6.52 |
| | | Percentage of students scoring ninety (90) percent or above | 80 |

**COMMENTS:**

The group consisted, as did Groups 2 and 3, of freshman students in the College of Business Administration at the University of Arkansas enrolled in the second semester of the course, American Economic Development. The members of the group saw the tape, worked the response sheet, and were tested.

Although the results were significantly better than the results of the group receiving the lecture, they were not as high as the other freshman class viewing the tape (Group 3).

A possible explanation for the lower results of this group in relation to Group 3 might be the time of day at which they saw the tape. They began viewing the tape at 4:45 in the afternoon. By the time the tape was over and they began taking the test, it was close to 6:00 p.m. Some of the students made reference to the late hour. This could very possibly be a contaminating factor which resulted in lack of attention, less retention, and lower test scores.

**GROUP 5B**

| STUDENT | SCORE | | |
|---|---|---|---|
| 1 | 100 | Graduate | NO |
| 2 | 95 | Undergraduate | YES |
| 3 | 90 | Tape | YES |
| 4 | 90 | | |
| 5 | 90 | Lecture | NO |
| 6 | 90 | | |
| 7 | 85 | Response Sheet | YES |
| 8 | 85 | | |
| 9 | 85 | | |
| 10 | 80 | | |
| 11 | 70 | Mean | 85 |
| | | Median | 90 |
| | | Mode | 90 |
| | | Standard Deviation | 7.5 |
| | | Percentage of students scoring ninety (90) percent or above | 55 |

**COMMENTS:**

Results shown above are for the second test given five days later for Group B.

A loss of retention is again seen by a drop in the value of the measures of central tendency and an increase in the values of the standard deviation and the range. The percentage of students scoring 90 percent or above fell from 80 to 55 percent but 90 percent of the students still scored above 80. The drop in retention does not appear to be significant.

**Conclusions of the Statistical Analysis**

This portion of the report will attempt to answer six questions. In following this approach it is believed that a logical conclusion regarding this study can be reached.

1. Do students learn more using audio-video programmed instruction or the traditional lecture method?

Although rigorous statistical techniques were not employed, the measures of central tendency and dispersion that were computed indicate that students using this particular tape scored higher than students who received a lecture over the same material. Additional statistical techniques are planned to see if, in the data collected, there is a statistical difference between the test results of the two groups. It is believed that statistical tests will support the conclusion that audio-video programmed instruction results in higher scores than traditional lectures.

2. Which teaching method leads to the greater retention of educational material?

Visual inspection of the results show that students' retention of the material declined somewhat. The table below may give some insight into the retention question.

| FIRST TEST | GROUP | | |
|---|---|---|---|
| | 2 | 3 | 5 |
| Percentage above 90% | 20 | 94 | 80 |
| Percentage above 80% | 40 | 100 | 100 |
| SECOND TEST | | | |
| Percentage above 90% | 14 | 36 | 55 |
| Percentage above 80% | 29 | 79 | 90 |

Additional statistical techniques may answer the question as to whether or not there is a statistial difference in the retention of "tape students" versus "lecture students".

3. Does the size of the participating group influence the learning process?

From an analysis of the data it appears that the audio-video method would work well with a very small group, i.e., 2 to 4 students or a large group, i.e., 35 to 40 students. It could be that a small group, encouraging good relations within the group, might work better than larger groups.

Group 4 was an attempt to measure the size-of-group effect. While the results were good, they were not conclusive. Our preliminary conclusion is that students would be just as hesitant to stop the tape and go back and review in a group of 6 or 7 as they would among 35 or 40. This might not be the case in a small group of 2 or 3. Our conclusion is that more testing is needed on efficiency in relation to group size.

4. Will viewing conditions influence the learning process?

The answer to this question is affirmative. The room in which the tape is shown to the students in our test was inadequate and not conducive to close attention on their part. Another factor affecting the results of the program is the time of day at which the tape is shown. It is definitely felt that the lower scores of Group 5 were the result of the late hour at which they saw the film.

We feel that traditional places of instruction will have to be modified to accommodate for this new teaching technique. The "best" situation will be achieved on a trial and error basis, but the right place and time are definitely factors to be considered.

5. Does the educational level of the participating group influence results?

It can be seen from the data at the beginning of this section that Group 1 did better than any of the undergraduate groups. However, it should also be noted that one of the undergraduate sections was not far behind, (Group 3). These results indicate that the method of audio-video programmed instruction can be used successfully on either graduate students or undergraduates. The material contained within the lesson may be increased for graduate classes but the method appears appropriate for either level.

6. Is working a response sheet a facilitative factor in learning by the audio-video taped instruction method?

Group 4 was an attempt to measure this variable but the results of the test were inconclusive. Further experimentation would support our belief that the use of a response sheet is a very important aspect in applying this educational technique. This serves to complete the process of hearing—seeing—writing which is the key to reinforcing student learning.

## IV. Relationship of Innovative Program to Academic Productivity

Such an innovation as programmed instruction on television tape could relieve many full-time instructors from lecture duty. The students could view the tape on their own, in small groups, or in a large auditorium; take a test; and be ready for discussion in small groups, using part-time instructors under the supervision of a major professor. Academic productivity could thus be improved by reduced costs with greater numbers of students learning the subject matter.

## V. Relationship of Innovative Program to Educational Quality

The quality of instruction is vastly improved over conventional methods. With a professional author, programmers, and television technicians, the educational process and student achievement are significantly improved. High standards of instruction can be instituted on a standardized basis, eliminating poor teachers. Students can learn faster, better, and at lower cost.

## VI. Relationship of Innovative Project to Content of Educational Programs

Contents of business administration courses can be upgraded by using high standards of instruction via programmed instruction on televised tape.

# ORGANIZATIONAL IMPLICATIONS OF ADVANCED COMPUTER-USE FOR STATE GOVERNMENT

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While business and industry have been actively exploring and expanding the parameters of computer-use in their operations, state governments have been very slow to fully utilize computers. Although it is unfortunate that most state governments have not attempted to implement more complex computer systems, this lag could prove to be beneficial: States can observe the operational effectiveness of private computer systems and act with better knowledge when they are ready to install similar, advanced systems.

States have been using computers mainly for the mechanization of well-understood clerical procedures such as payroll preparation, tax and appropriation accounting, and other manipulations of figures. A survey examining the use of computers in state governments came to this conclusion:

> Generally, it seems safe to say that most states have not yet achieved minimally productive use of their computers. Only a few have begun to exploit computers for their full potential and contribution to broader decision-making.[1]

Use of management information and control systems (MICS) remains virtually unexplored by state governments. These systems can integrate large amounts of data from many scattered sources and provide needed information for varied management requirements.[2]

As private companies have been installing MICS for their operations, they have been aware that this change in technology would likely alter the structure and functioning of their organizations. Much has been written predicting what the possible social and organizational implications of this advanced technology will be. Until recently, however, few empirical studies had been made to discover the actual changes and causally relate them to the introduction of advanced computer technology.

States will be able to take advantage of these present and future studies when they are ready to install their advanced systems. They should be able to predict what changes in the organization and structure of state government will result from implementation of different systems. Such forewarning allows states to make preparations for the future.

Not only do state governments need to prepare for organizational changes resulting from the implementation of management information and control systems, they need to consider what types of organizational changes should be made in preparation for the implementation of the new computer systems. Just as the computer can produce dysfunctional elements in an unprepared organization, an unprepared organization can debilitate the strengths of a computer. State governments need to, within the definition of their goals, prime the organization for the computer and vice versa. A study of computer use in state governments

emphasizes this point:

> Through their capacity for receiving, preserving, treating, and communicating information, the equipment and appliances of computer technology have broad implications for the organization and operations of state governments. Alteration in traditional state organization and management will be needed if computers are to be brought to their full use. In the process of this fulfillment, the wise use of computers may contribute to and accelerate administrative changes which themselves will produce a still more effective use of computer technology.[3]

In the following pages I will examine the present and potential uses of computers in state governments and the limitations upon their use. In addition, I will survey the computer-induced organizational changes most evident in private companies which have installed advanced MICS for their use, relate these organizational changes to the peculiarities of state governments, and suggest possible outcomes which might be used to the advantage of public administrators in the states.

**Present Uses** - Like everything else in state government, except revenue, the number of computers in operation has increased tremendously since 1961. In that year, 130 computers were in use by state governments. Five years later, in 1966, approximately 382-397 computers were being employed by state governments. Between the years 1965 and 1966 alone, the number of computers in state governments grew by 22 percent.[4]

Computers are of greatest potential use in state government in three main areas: (1) Administrative activities; (2) Scientific and engineering activities; and (3) Program activities. The first two uses have found a comfortable place in state administration. It is, however, generally conceded that state governments have not adequately employed the third important use to aid in decision making:

> In the eyes of the experts in the EDP area, it seems to be unanimous that state and local governments are neglecting the greatest potential of EDP - the application of the systems concept. At the state and local government level, systems analysis is being largely neglected with but few exceptions. Recruiting and training aim at immediate problems that are most easily satisfied. They attend to programmers and equipment operators, but neglect systems analysts.[5]

The highway commissions accounted for about one-quarter of the total 2,701 computer-uses reported by 32 states in 1966-1967. The financial administrators (administration departments, revenue departments, etc.) accounted for one-third of the total reported uses. The smallest users, each accounting for fewer than 20 of the 2,704 uses, were planning, housing and urban renewal offices, judicial offices, and legislative bodies.[6]

The highway commission utilized the computer for both scientific, engineering, and administrative purposes. The financial administrator used computers mainly for administrative purposes. The last three groups need information for planning and decision-making purposes. Harry Fite was probably correct when he observed, "To date, computers have mainly been used as paper balers."[7]

**Other Possible Uses** - State governments will inevitably turn to many advanced uses of computers in order to increase the efficiency and rationality of their administration. John Pfiffner and Robert Presthus, in their book on public administration, listed the following possible uses of computers that state governments might try: (1) Mechanization of clerical work; (2) Storage of information; (3) Management by exception (providing selective data to managers); (4) Coordination (control) of complex operations such as missile systems; (5) Processing of research data; (6) Training through simulation and game theory; (7) Study of policy, strategy, and decision through simulation.[8]

**Management Information and Control System (MICS)** - Most of these uses are integral parts of management information and control systems (MICS) whose objectives are to make or control decisions which can be programmed and to provide information (or data) to assist managers in making non-programmed decisions.[9] (For the purpose of this paper the terms "MICS" and advanced computer systems shall by synonymous.)

Each of these two types of decisions, programmed and non-programmed, have distinctive features. Programmed decisions are routine, repetitive decisions. By means of mathematical analysis, construction of models, and use of computer simulation the decision making criteria can be *programmed* into a computer and when given a set of data, the computer can "make" the most rational decision. Non-programmed decisions are unique, one-shot, unstructured policy decisions which are handled by the general human problem-solving process.[10] Because of their complexity and uniqueness, these decisions cannot be *programmed* for computer solution. The computer can, however, provide the information necessary to make a more rational decision.

An MICS relieves managers of routine, repetitive decisions and ensures that the problems are solved in the most rational manner; and provides, when requested by management, the requisite information for solving policy questions. This information can be in the form of summary information; analytical information, including linear programming, critical-path analysis, and PERT; and historical

information - whatever the manager requires to make the best decision.[11]

The establishment of a MICS in a state government would have to assume the government to be a group of integrated, related components. Raw data from all (or most) of the components (agencies and departments) would be sent to a central computing center in order to provide for a complete, adequate data base. Safeguards must be included to protect confidential information entered into the central files. No one should have access to, or be able to obtain, any confidential records without permission.

This type of "unified information system" for a state government was proposed and outlined by Edward F. R. Hearle and Raymond Mason as early as 1963.[12] These authors described what they called a system "designed for the 1970's." The system, operating as pictured below in Figure 1, was designed to "enable environmental data to be efficiently organized into records about persons or property they describe."[13] In other words, instead of keeping data compiled according to function divisions (revenue records, correctional records, state police records, etc.), all information about one person (or one piece of property) would be kept in one file in the data bank. Such a means of storage would end the inefficient storage of the same piece of data in many different places. It would also supply the data necessary for government planning, policy-making, and decision-making operations.

The ultimate goal of the "unified information system" would be to provide all managers throughout state government with information to (1) consider the full effect of a decision in advance; (2) provide information consistent for both long-range and short-range planning; (3) make use of modern mathematics in identifying, structuring, and quantifying past relationships and forecasting future relationships.[14]

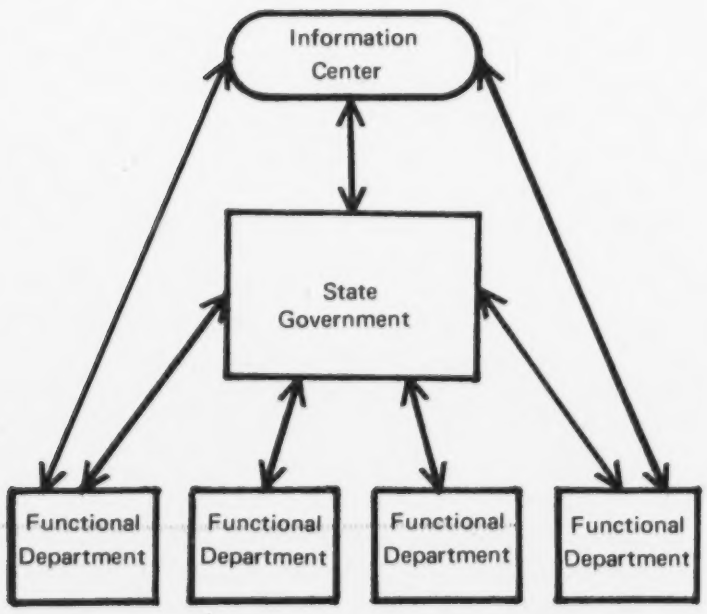


**Figure 1: Unified Information System**[15]

**Impediments To The Installation Of Advanced Computer Systems** - The management information and control field is wide open for state development. However, there are several reasons why states have been slow to adapt or develop these helpful management tools. These same factors will work to impede future attempts to install advanced computer systems. Below are listed the major blocks to the development and use of advanced computer systems in state governments:

1. Lack of Money
   a. Not enough money available to purchase equipment
   b. Inadequate resources for maintenance of equipment
2. Operational Pressures
   a. Lack of time for adequate planning
   b. Lack of time for research and implementation of advanced systems.
3. Resistance to Change
   a. Built-in inertia of government
   b. Political appointees try to protect jobs
   c. Fear of losing jobs or functions
   d. Tradition
4. Civil Service Restrictions
   a. Inability to compete for required technical personnel because of low salaries
   b. Inability to get rid of "machine replaceable" employees
5. Open Nature of Government
   a. Accountability diffused by government
   b. Information storage by computer makes it more inaccessible to the public
6. Diffusion of Executive Functions
   a. Agencies are separate from each other
   b. Agencies are free from control of governor
   c. There is a functional overlap between agencies

The overriding reasons why state governments have not been able to make use of up-to-date systems are the first three listed above. State administrators are constantly working within limited budgets with many different operations competing for scarce resources. The computer uses instituted so far have been demonstratably self-supporting. They can replace $x$ number of employees or do the job $y$ times quicker. However, the cost-benefits of management information and control systems are not so evident.

Even if the money were available, the time for research and implementation of the system is not:

> Population growth, urbanization, industrialization, economic development and other accompanying changes all occurring at the same time make the introduction of EDP in state and local government an extremely difficult and complex problem - all will continue to do so for some time.[16]

State governments have grown in duties and size at a fantastic rate. States are strained to provide the basic services expected from them. They are forced to solve problems on an ad hoc basis and perform those actions needed to justify their existence. Until the pressure eases off, it will be extremely hard to develop and implement an optimal MICS for each state's use.

As if these two problems were not enough, the usual inertia of a heavily bureaucratic government slows any drive for modernization. Carnog describes the attitude of governments toward change:

> The basic political system that has developed historically in the United States favor the maintenance of the status quo against pressure toward change . . . As a result, when basic changes occur in other facets of the social system, we can expect to find [that] the difficulties and problems . . . out-distance our political ability to adjust to them.[17]

**Preparation For An MICS** - Assuming that these difficulties can be transversed, what are the initial steps necessary for establishment of an MICS? As mentioned earlier, a unified information and control system for state government must consider the government to be an interrelated organization, not just several unrelated agencies. This is difficult since the executive branch has traditionally been characterized by a diffusion and separateness which was designed to protect agencies from political influence. Agencies have frequently operated independently of each other and even independently of the governor. Fite believes that for the best use of a state government MICS, the agencies must be psychologically "unitized," i.e., the different agencies must realize that they are part of a whole. He says this is the most difficult hurdle in preparing for an MICS:

> Mastery of the equipment is difficult enough, but that is by far the easiest part of the task. The really hard job will be to understand, accept, and apply a new way of conceptual thinking - the total systems concept - which is capable of seeing government as a whole, yet is able to deal with its utmost details and all their relationships.[18]

This psychological preparation is the first step toward implementation of an MICS.

**Centralization Of Information** - One of the main requirements for a MICS is centralized information. It must be emphasized to all components involved in the data bank that centralization of information is not to be confused with centralization of management. Centralization of information allows external or environmental data for all agencies to be stored efficiently and ensures a greater amount of the information needed by each agency will be available at one source. As Hearle and Mason describe it, "The system is designed to accommodate a variety of organizational structures–in themselves either centralized or decentralized–and to furnish them the information they need."[19] The process of receiving information is best described by this statement: "Data are stored like information in a library and can be 'checked out' by an agency or person authorized to do so."[20]

**Conclusion** - It is critical for state and local governments to begin to find ways to get more work done in less time and with the same number of people. The growth in state workers from 4,285,000 in 1950 to 6,387,000 in 1960 to over 8,000,000 in 1967 indicates the great increase in state government's activities. Such a tremendous increase in employees and, concomitantly, expenditures, cannot be sustained indefinitely. Demands for services can. State governments must begin to shift the increasing burden of state services into the available technology. While doing this, states need to be aware of the effect that this change will have on the organization of state government. Such awareness will assure a smooth transition and preclude possible breakdowns.

## FOOTNOTES

1. Public Administration Service, Automated Data Processing in State Government, (Chicago: Public Administration Service, 1965), p. 27.

2. This term (MICS) and definition is taken from Bartow Hodge and Robert N. Hodgson, Management and the Computer in Information and Control Systems, (New York: McGraw-Hill, 1969).

3. Public Administration Service, Processing, p. 2

4. Council of State Governments and Public Administration Service, Automation in State Government 1966-1967: A Second Report on Status and Trends. (Chicago: Public Administration Service, 1967), p. 9.

5. Geoffrey Y. Cornog, "Change, Management, and Electronic Data Processing in State and Local Government," in Geoffrey Cornog, James Kenney, et. al., EDP Systems in Public Management, (Chicago: Rand McNally, 1968), p. 8.

## FOOTNOTES (Cont'd)

6. Council of State Governments, Automation 1966-1967, p. 36.
7. Harry Fite, Computer Challenge to Urban Planners and State Administration, (Washington, D. C.: Spartan Books, 1965), p. 28.
8. John Pfiffner and Robert Presthus, Public Administration, (New York: Ronald Press Company,1967), p. 237.
9. Hodge and Hodgson, Management and Computer, p. 214.
10. Herbert A. Simon, The New Science of Management Decision, (New York: McGraw Hill, 1968), p. 8.
11. David H. Li, Accounting, Computers, Management Information Systems. (New York: McGraw Hill, 1968), p. 214.
12. Edward F. R. Hearle and Raymond J. Mason, A Data Processing System for State and Local Government, (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1963).
13. Hearle and Mason, DP for State, p. 51.
14. Li, Management Information Systems, p. 225.
15. Hearle and Mason, p. 50.
16. Cornog, "Change," p. 9.
17. Ibid.
18. Fite, Computer Challenge, p. 19.
19. Hearle and Mason, DP for State, p. 57.
20. B. G. Schumacher, Computer Dynamics in Public Administration, (Washington, D. C.: Spartan Books, 1967) p. 96.

**NOTE: THE FOLLOWING ARTICLE APPEARED IN THE MAY, 1971, ISSUE OF THIS REVIEW, BUT SEVERAL PARAGRAPHS WERE OUT OF ORDER. WITH APOLOGIES TO THE AUTHOR FOR OUR ERROR, WE HEREBY PRESENT THE ARTICLE AS IT WAS ORIGINALLY SUBMITTED.**

# PREREQUISITES FOR ECONOMIC DEVELOPMENT DURING THE REMAINDER OF THE TWENTIETH CENTURY*

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Charles Dickens began one of his best known novels with the phrase: "It was the best of times, it was the worst of times." I mention this because a loose paraphrase of this statement applies, I think, to my subject to-day: It is an easy subject to discuss, and yet it is a difficult subject.

The prerequisites of economic development are fairly well documented. A brief review of generally accepted ideas relative to economic development would not be difficult. And I do plan to mention, and perhaps embellish, some of the generally accepted ideas. However, the importance of this occasion, I think, demands that I go further than this, and that I make an attempt to probe into areas of uncertainty—areas of conceptual uncertainty as well as areas of uncertainty as to the future.

First of all, a satisfactory definition of economic development is not easy to phrase. Frequently (too frequently, I am afraid) we casually equate development with mere growth. I will define economic development as increased efficiency in the production and distribution of goods and services, using the term "efficiency" in a very broad sense.

Now, of course, growth and development frequently go hand in hand, if for no other reason than that increased efficiency usually stimulates, or at least permits, growth. However, depending on the place, time and other circumstances, growth may or may not be conducive to efficiency. To be sure, the word "growth" itself has various possible meanings, but to say the least, growth in population does not under all circumstances promote efficiency, as is illustrated by certain densely populated areas of the globe.

It is true that during much of our national history, population growth was conducive to efficiency. However, this may no longer be true in many areas of the United States, and before the end of this century it may no longer be true of the State of Arkansas. In fact, Arkansas' recent history is interesting in this respect. Following World War II considerations of efficiency resulted in many small farms being converted to non-crop uses. This, in turn, resulted in a loss of population for a time. Yet there was economic development in the state during the period of declining population. The overall efficiency of the economy of the State increased, and per capita income increased. Not everyone who left or ceased to cultivate small farms left the State. Some were available as workers, and did become workers in newly established industrial plants, where they were more efficiently employed than they had been in crop farming. And, of course, the more efficient mix of the State's economy did, in time, begin to attract or to hold an expanding population.

*Delivered at the University of Arkansas Centennial Symposium on Economic Development, Little Rock, Arkansas, April 6, 1971.

I will not belabor this matter any further. My point is that if there are improvements in economic efficiency, the matter of growth will take care of itself.

If increased efficiency is the key to (and even a definition of) economic development, what then are the prerequisites of increased economic efficiency? I suggest that in some sense the capstone prerequisite is this: The discovery and/or the adoption of improved technological and managerial methods, using all of these terms in the broadest possible sense to include among other things the achievement of the most efficient mix of the factors of production. But if this is the capstone prerequisite, there are many conditions which, if present, will facilitate and support the discovery and adoption of improved technological and managerial methods. Among these facilitating and supporting conditions, I list:

1. An adequate base of general education and specific training;
2. Stable political and social conditions;
3. Efficient governmental organization and operation;
4. The formulation and execution of governmental policies of such nature and in such a way as to be conducive to increased economic efficiency;
5. Favorable environmental conditions.

In addition, there are important parts and aspects of the economy itself which are so basic as to deserve special mention. A specialized exchange economy involving the application of scientific methods (and this is the only efficient type of economy we have discovered) can not operate at an increasing level of effectiveness unless it contains these basic characteristics:

1. A stable system of money and banking;
2. A level of saving, together with a base of financial institutions, adequate to finance the adoption of the most efficient technological and managerial methods;
3. An adequate transportation base;
4. An adequate energy base;
5. An adequate water base;
6. An adequate communications base;
7. And for any particular state, another very important factor is a well functioning and developing national economy.

Finally, there is a cornerstone upon which all of these other factors depend to a very great extent, and that cornerstone is the people: Their character, attitudes, habits, ideas, ideals, and goals.

Now this is not a complete list of the prerequisites for a high rate of economic development, nor is it necessarily the best short list that might be prepared. However, it is sufficient for my concluding comments. And so I will ask this rhetorical question: What items on this list appear to have particular relevance as we contemplate the remainder of the century? What is the outlook for economic development?

If we confine our view to factors within the state of Arkansas certainly optimism is justified, in spite of some rather obvious weaknesses. (Incidentally, I will refrain from any mention of the educational base as a factor of either weakness or strength, inasmuch as I may have a biased view with respect to education.) But let us consider some other factors. In spite of the fact that the overall adequacy and efficiency of the transportation base is being enhanced by the Arkansas River Project, the transportation base remains, in my opinion, inadequate. Arkansas always has had relatively low railroad mileage, and, of course, there is no prospect for the construction of railroads. Furthermore, based simply on personal observation covering many states, it is my opinion that our system of highways, roads and city streets is inadequate. And it appears to me that our airport facilities have not kept pace. Unless the inadequacy of our transportation base is remedied, it is certain to affect our rate of economic development adversely.

The inadequacy of our county roads, city streets, and airport facilities underlies a related, but broader weakness: That is the inadequacies in our city, county and other local governmental and quasi-governmental units. Exactly how effective recent action will prove to be as a remedy for this defect remains to be seen. In any case it is essential that these governmental units be able to finance an adequate and efficient base of services, including an adequate system of roads, streets, and airport facilities. The same problem appears to exist at the state level, although the constraints at the state level apparently have not been so great—in theory at least.

Back of the financial difficulties of governmental units lies a lack of understanding and appreciation on the part of the public of the economics of state and local government, and in fact a lack of understanding of basic economic principles in general.

Time does not permit even brief remarks relative to other weaknesses or potential weaknesses at the state and local levels, such as the quality of regulation of the private institutions which provide the financial, transportation, energy and communication bases for further economic development.

I must, however, make some mention of the national economy, both for its own sake, and because of its great impact on economic development in Arkansas.

I think that it can be said without much equivocation that one necessary condition for the continuation of a satisfactory rate of economic development nationally (and therefore in Arkansas as well) is the restoration of confidence in the stability of the value of our medium of exchange—the dollar. Inflation must be halted—or at least reduced to a minimal rate. It is rather commonly believed that inflation spurs economic development, or at least that inflation spurs economic growth, which, as I have previously noted, often is equated with economic development. In fact, it has become common-place to use the word "inflation" as describing the condition opposite to recession or depression.

Well, let's look at this proposition. The belief that inflation stimulates economic development rests primarily on the assumption that inflation produces low interest rates and low real wage rates and labor costs, and thus produces high profits and a high level of saving, which, in turn, encourages capital investment and thus economic development. It is assumed also that inflation produces speculative gains (at least on paper) and thus produces a psychological atmosphere favorable to risk-taking. An it is alleged that inflation washes away the ill effects of business mistakes and thus reduces the number of business failures. It is pointed out also that inflation results in an overstatement of profits on traditionally prepared financial statements, and that this also provides a psychological lift.

Skeptics always have pointed out that these particular results will occur only as long as savers, consumers, workers, managers, and the public generally are not fully aware of the effect of inflation on the real value of accunulated savings, the cost of living, real wage rates, real profit rates, etc. In other words, the stimulative attributes of inflation will endure only as long as the future effects of inflation are not fully discounted in the judgments and actions of the majority of the people.

The views of the skeptics now are being vindicated by events in the United States, just as their views have been vindicated in many other countries on many other occasions. Today, we are finding that in its later stages, inflation produces high interest rates—not low interest rates; high labor costs—not low labor costs; low profit rates—not high profit rates; a high rate of business failure—not a low rate of business failure; economic inefficiency—not economic efficiency or economic development. It is obvious also that inflation has been a major factor responsible for the poor financial condition of state and local governmental units, for social unrest, and for other conditions which mitigate against economic progress.

Finally, if the economic development of the nation is to continue, some of the trends in public attitudes must be reversed; the deep divisions and antagonisms between groups must be reduced; and appreciation of our heritage, and faith in our political and economic systems, and in ourselves, must be restored; the crucial role of individual responsibility and self discipline must be emphasized; and there must be a rededication to the entirely justifiable proposition that through hard work, co-operation, unity, and wisdom, all aspects of American life—spiritual and cultural as well as economic—can and will reach a new high level during the remainder of the 20th century.

# STATE AND REGIONAL ECONOMIC INDICATORS

Total employment (seasonally adjusted) fell in the second quarter of 1971 by 0.9 percent marking the first decline since the third quarter of 1970. Manufacturing employment increased slightly while non-manufacturing and agricultural employment declined from first quarter levels. Seasonally adjusted unemployment, however, declined from 5.6 to 5.4 percent while the national rate rose from 5.9 to 6.0 percent.

On an unadjusted basis, total employment increased by 29,200 to a total of 707,000, the first increase in three quarters. The unadjusted unemployment rate for both Arkansas and the nation fell considerably to 5.9 and 5.6 respectively.

Value added by manufacture for both Arkansas and the nation continued an expansionary trend with increases of 4.9 and 2.4 percent over the first quarter of 1971. The 4.9 percent increase for Arkansas is only slightly greater than the 4.8 percent increase for the first quarter, but is the best gain since mid 1968. The 2.4 percent rise in the national figure marks the second consecutive quarter of increase of the five previous quarters of decline.

The dollar value of construction contracts was considerably higher than the previous quarter with increases (not seasonally adjusted) of 37.6 percent for residential construction and 114.1 percent for nonresidential construction. These increases came at a time of the year when construction activity normally rises, but the second quarter changes are the highest since the second quarter of 1967 in residential construction and the third quarter of 1968 in nonresidential construction. It appears that residential construction is faring considerably better in Arkansas than it is nationally.

Cash receipts from farm marketings rose to $170,548,000 in the second quarter. On a seasonally adjusted basis this represented an increase of 19.4 percent above cash receipts in the first quarter. After two consecutive quarters of gain, however, cash receipts are still somewhat below the level for comparable quarters in 1970.

Personal income in Arkansas increased again in the second quarter by a healthy 3.9 percent, thus, the slight decline in employment appears to be more than offset by increases in other sectors of the economy. This is less than the increase of 7.8 percent experienced in the first quarter, but is higher than the 2.8 percent experienced nationally. Seasonally adjusted personal income in Arkansas was at the $1,510 million level in the second quarter and has risen each quarter since the first quarter of 1969, often at rates considerably higher than those experienced nationally.

Seasonally adjusted retail sales, after a record 9.0 percent increase in the first quarter declined slightly by 0.9 percent. This marked the first such decline since the first quarter of 1970. The seasonally adjusted decline was approximately $8 million from $883 million in the first quarter to $875 million in the second quarter. The $875 million still represents an $88 million increase in seasonally adjusted sales over the second quarter of 1970.

In summary, while employment and retail sales declined slightly (both by less than 1.0 percent), the remaining economic indicators continued a pattern of advancement established in the first quarter of this year. While both Arkansas and national indicators moved in the same direction in the second quarter, Arkansas's declines were less and the increases were greater than the national changes. Resulting effects of recent national economic policies (wage and price freeze) are not certain at this time, but the performance of the Arkansas economy in the first half of this year is encouraging.

# REGIONAL ECONOMIC INDICATORS

| | | | | |
|---|---|---|---|---|
| ARKANSAS COUNTY | | | | |
| (1970 population 23,509) | | | | |
| Bank Debits | $ | 117,698.9 | - | 0.7 |
| Stuttgart | | | | |
| (1970 population 10,472) | | | | |
| Bank Debits | $ | 117,698.9 | - | 0.7 |
| BENTON COUNTY | | | | |
| (1970 population 48,009) | | | | |
| Bank Debits | $ | 174,471.0* | + | 25.7 |
| Rogers | | | | |
| (1970 population 10,729) | | | | |
| Value Bldg. Permits | $ | 1,241.3 | + | 170.0 |
| Bank Debits | $ | 61,246.3 | + | 22.5 |
| Industrial Elec. Use | kwh | 10,654.8 | - | 11.1 |
| *6 up out of eight banks reporting | | | | |
| BOONE COUNTY | | | | |
| (1970 population 18,499) | | | | |
| Bank Debits | $ | 80,732.1 | + | 9.8 |
| Harrison | | | | |
| (1970 population 7,634) | | | | |
| Bank Debits | $ | 80,732.1 | + | 9.8 |
| CHICOT COUNTY | | | | |
| (1970 population 17,392) | | | | |
| Lake Village | | | | |
| (1970 population 3,213) | | | | |
| Bank Debits | $ | 17,123.6 | + | 10.4 |
| CRAIGHEAD COUNTY | | | | |
| (1970 population 51,698) | | | | |
| Jonesboro | | | | |
| (1970 population 26,934) | | | | |
| Value Bldg. Permits | $ | 1,376.2 | - | 2.2 |
| Bank Debits | $ | 227,752.8 | + | 2.5 |
| Industrial Elec. Use | kwh | 9,324.4 | + | 2.5 |
| CRITTENDEN COUNTY | | | | |
| (1970 population 48,272) | | | | |
| West Memphis | | | | |
| (1970 population 25,796) | | | | |
| Bank Debits | $ | 115,644.6 | + | 11.5 |
| Industrial Elec. Use | kwh | 3,034.1 | - | 4.8 |
| FAULKNER COUNTY | | | | |
| (1970 population 20,969) | | | | |
| Bank Debits | $ | 90,377.3 | + | 10.5 |
| Industrial Elec. Use | kwh | 4,210.1 | + | 4.0 |
| Conway | | | | |
| (1970 population 15,286) | | | | |
| Value Bldg. Permits | $ | 643.2 | + | 78.9 |
| Bank Debits | $ | 90,377.3 | + | 10.5 |
| Industrial Elec. Use | kwh | 4,206.3 | + | 27.5 |
| GARLAND COUNTY | | | | |
| (1970 population 53,043) | | | | |
| Bank Debits | $ | 216,942.2 | + | 21.9 |
| Hot Springs | | | | |
| (1970 population 35,319) | | | | |
| Bank Debits | $ | 216,942.2 | + | 21.9 |
| Industrial Elec. Use | kwh | 33,169.8 | + | 46.8 |
| INDEPENDENCE COUNTY | | | | |
| (1970 population 22,276) | | | | |
| Batesville | | | | |
| (1970 population 7,074) | | | | |
| Value Bldg. Permits | $ | 1,369.2 | + | 17.2 |
| Industrial Elec. Use | kwh | 15,280.7 | + | 24.9 |
| JEFFERSON COUNTY | | | | |
| (1970 population 83,357) | | | | |
| Average Employment | | 33.2 | + | 4.6 |
| Bank Debits | $ | 406,284 | + | 15.4 |
| Pine Bluff | | | | |
| (1970 population 55,597) | | | | |
| Value Bldg. Permits | $ | 2,175.0 | + | 72.4 |
| Bank Debits | $ | 394,816.4 | + | 15.9 |
| Industrial Elec. Use | kwh | 29,844.1 | - | 2.0 |
| MILLER COUNTY | | | | |
| (1970 population 32,201) | | | | |
| Bank Debits | $ | 401,736 | + | 10.3 |
| Employment | | 45.5 | | N.A. |
| Texarkana | | | | |
| (1970 population 21,088) | | | | |
| Bank Debits | $ | 344,050.1* | + | 11.3 |
| Industrial Elec. Use | kwh | 13,657.3 | + | 4.7 |
| *Texarkana SMSA which includes Miller County in Arkansas, Bowie County in Texas. | | | | |
| MISSISSIPPI COUNTY | | | | |
| (1970 population 61,481) | | | | |
| Blytheville | | | | |
| (1970 population 7,135) | | | | |
| Industrial Elec. Use | kwh | 31,395.0 | - | 25.0 |
| Osceola | | | | |
| (1970 population 24,506) | | | | |
| Industrial Elec. Use | kwh | 5,927.2 | - | 25.1 |
| OUACHITA COUNTY | | | | |
| (1970 population 31,262) | | | | |
| Camden | | | | |
| (1970 population 14,734) | | | | |
| Value Bldg. Permits | $ | 724.5 | + | 211.5 |
| Bank Debits | $ | 78,874.7 | - | 1.7 |
| Industrial Elec. Use | kwh | 37,368.3 | + | 6.2 |

## REGIONAL ECONOMIC INDICATORS (continued)

| | | | |
|---|---|---|---|
| **PHILLIPS COUNTY** | | | |
| (1970 population 39,672) | | | |
| Industrial Elec. Use | kwh | 16,775.9 * | + 3.7 |
| **Helena** | | | |
| (1970 population 10,382) | | | |
| Value Bldg. Permits | $ | 1,039.5 | + 76.9 |
| Bank Debits | $ | 74,769 | + 21.2 |
| **West Helena** | | | |
| (1970 population 10,937) | | | |
| Value Bldg. Permits | $ | 489.9 | + 246.6 |

*Includes Helena and West Helena only.

| | | | |
|---|---|---|---|
| **POLK COUNTY** | | | |
| (1970 population 13,041) | | | |
| Bank Debits | $ | 60,361.2 | + 18.6 |
| **Mena** | | | |
| (1970 population 4,481) | | | |
| Bank Debits | $ | 60,361.2 | + 18.6 |
| Value Bldg. Permits | $ | 251.6 | + 119.7 |
| Industrial Elec. Use | kwh | 2,486.5 | - 8.2 |
| **PULASKI COUNTY** | | | |
| (1970 population 279,691) | | | |
| Average Employment | | 143.2 | N.A. |
| Bank Debits | $ | 2,839,141.0* | + 29.3 |
| **Little Rock** | | | |
| (1970 population 128,880) | | | |
| Value Bldg. Permits | $ | 10,802.7 | + 0.1 |
| Bank Debits | $ | 2,674,529.1 | + 43.7 |
| Industrial Elec. Use | kwh | 66,262.2 | + 8.8 |
| **Jacksonville** | | | |
| (1970 population 19,306) | | | |
| Industrial Elec. Use | kwh | 25,217.3 | + 38.0 |

*Little Rock-North Little Rock SMSA redefined to include Pulaski and Saline Counties.

| | | | |
|---|---|---|---|
| **SEIVER COUNTY** | | | |
| (1970 population 11,272) | | | |
| Bank Debits | $ | 22,891.1 | N.A. |
| Industrial Elec. Use | kwh | 4,320.1 | N.A. |
| **DeQueen** | | | |
| (1970 population 3,863) | | | |
| Value Bldg. Permits | $ | 200.5 | N.A. |

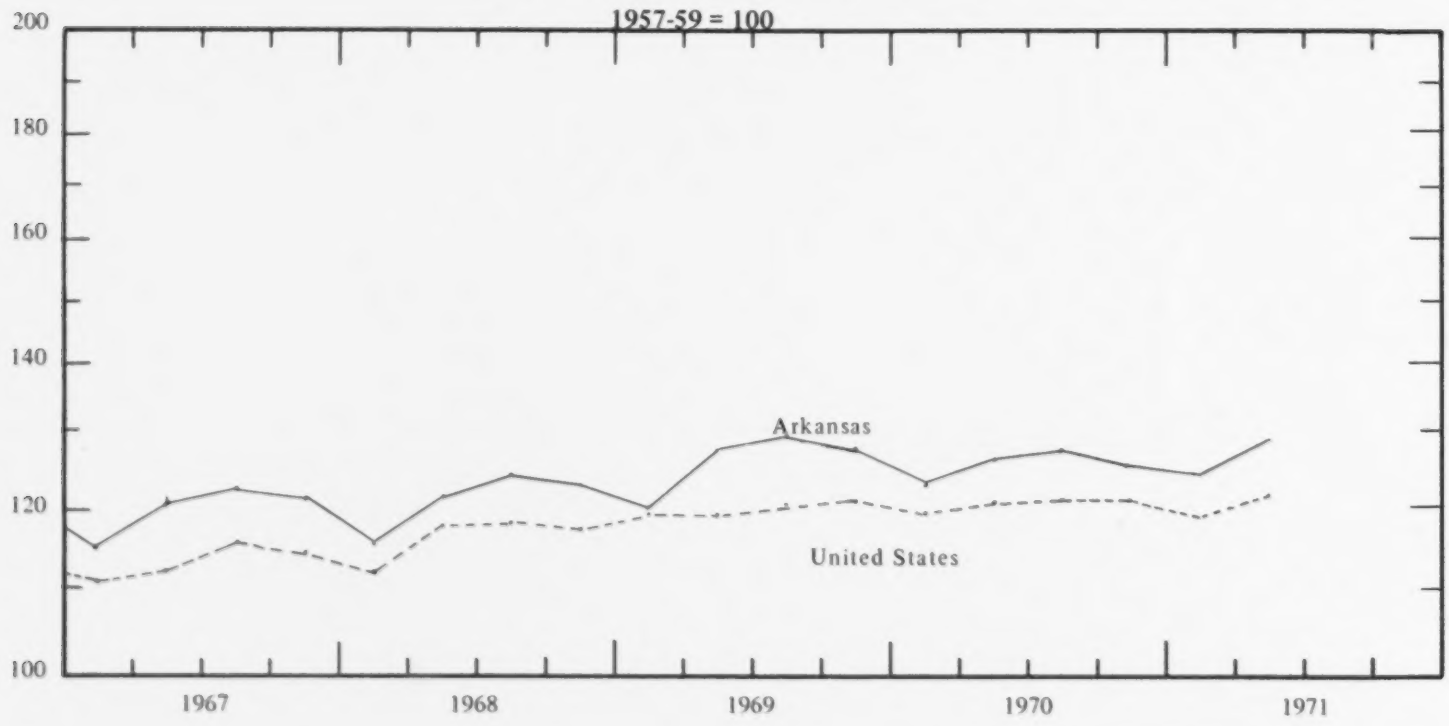
| | | | |
|---|---|---|---|
| **SEBASTIAN COUNTY** | | | |
| (1970 population 77,641) | | | |
| Average Employment | | 59.4 | + 8.3 |
| Bank Debits | $ | 758,193.0* | + 17.9 |
| **Fort Smith** | | | |
| (1970 population 61,549) | | | |
| Value Bldg. Permits | $ | 5,187.4 | - 15.5 |
| Bank Debits | $ | 507,059.6 | + 11.4 |
| Industrial Elec. Use | kwh | 49,776.4 | + 10.3 |

*Fort Smith SMSA includes Sebastian and Crawford counties in Arkansas and LeFlore and Sequoyah counties in Oklahoma.

| | | | |
|---|---|---|---|
| **UNION COUNTY** | | | |
| (1970 population 43,905) | | | |
| Bank Debits | $ | 253,869.0 | + 3.5 |
| **El Dorado** | | | |
| (1970 population 24,140) | | | |
| Value Bldg. Permits | $ | 1,678.5 | + 449.6 |
| Bank Debits | $ | 253,869.0 | N.A. |
| Industrial Elec. Use | kwh | 64,831.3 | + 0.3 |
| **WASHINGTON COUNTY** | | | |
| (1970 population 76,426) | | | |
| Average Employment | | 35.3 | + 10.1 |
| **Fayetteville** | | | |
| (1970 population 31,080) | | | |
| Value Bldg. Permits | $ | 2,834.0 | - 23.7 |
| Bank Debits | $ | 237,177.6 | + 22.0 |
| Industrial Elec. Use | kwh | 27,370.3 | + 20.8 |
| **Springdale** | | | |
| (1970 population 16,459) | | | |
| Bank Debits | $ | 207,012.0 | + 23.2 |
| Industrial Elec. Use | kwh | 12,160.8 | - 3.1 |

## INDEX TOTAL EMPLOYMENT, ARKANSAS and UNITED STATES

Quarterly data, not seasonally adjusted




(Semi-logarithmic scale: equal slopes indicate equal rates of change)

### Quarterly Change in Total Employment

Not seasonally adjusted, percent

| | 1957-59 to 2nd qtr 1971 | 2nd qtr 1970 to 3rd qtr 1970 | 3rd qtr 1970 to 4th qtr 1970 | 4th qtr 1970 to 1st qtr 1971 | 1st qtr 1971 to 2nd qtr 1971 |
|---|---|---|---|---|---|
| Arkansas | + 28.7 | + 0.6 | - 1.5 | - 2.5 | + 4.3 |
| United States | + 21.2 | + 1.0 | - 1.0 | - 1.8 | + 1.9 |

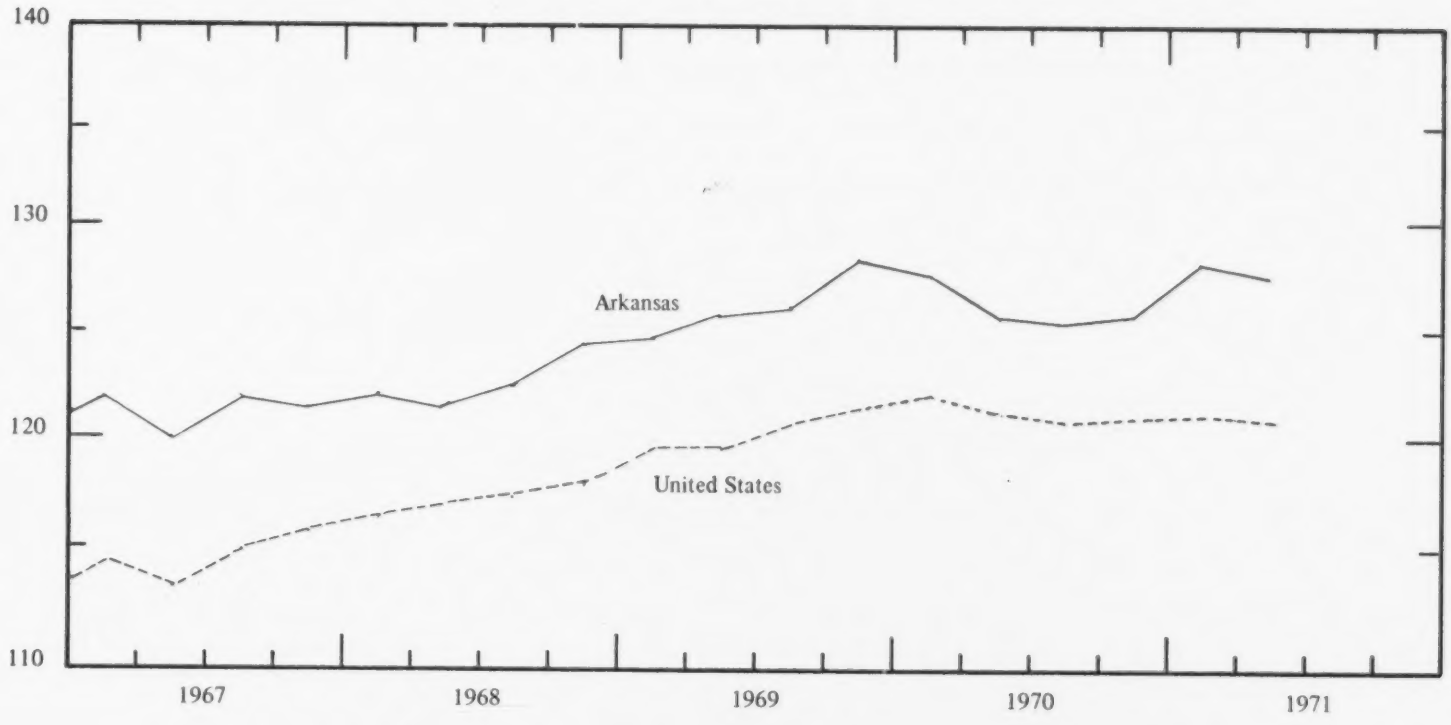
## EMPLOYMENT BY MAJOR INDUSTRY GROUP IN ARKANSAS, and UNEMPLOYMENT, ARKANSAS AND UNITED STATES

Not seasonally adjusted

| TIME PERIOD | EMPLOYMENT | | | | UNEMPLOYMENT RATE | |
|---|---|---|---|---|---|---|
| | Nonagricultural | | Agricultural | Total Employment | Arkansas | United States |
| | Manufacturing | Nonmanufacturing | | | | |
| 1962 | 113,200 | 283,600 | 83,500 | 595,300 | 5.9 | 5.5 |
| 1963 | 119,400 | 295,500 | 80,500 | 611,300 | 5.1 | 5.7 |
| 1964 | 125,400 | 303,600 | 70,700 | 616,600 | 5.5 | 5.2 |
| 1965 | 134,200 | 321,100 | 65,100 | 638,400 | 5.1 | 4.5 |
| 1966 | 147,900 | 337,500 | 54,200 | 646,500 | 4.4 | 3.8 |
| 1967 | 153,300 | 345,200 | 56,200 | 659,000 | 4.5 | 3.8 |
| 1968 | 157,700 | 351,800 | 58,900 | 670,000 | 4.3 | 3.6 |
| 1969 | 164,700 | 363,700 | 62,300 | 693,300 | 4.2 | 3.5 |
| 1970 | 165,200 | 367,200 | 57,400 | 692,400 | 5.2 | 4.9 |
| 2nd qtr | 165,500 | 368,100 | 66,500 | 701,600 | 5.3 | 4.7 |
| 3rd qtr | 166,300 | 370,100 | 64,300 | 705,300 | 5.2 | 5.2 |
| 4th qtr | 163,200 | 370,200 | 56,700 | 690,200 | 5.1 | 5.4 |
| 1971 | | | | | | |
| 1st qtr | 162,300 | 362,800 | 50,800 | 677,800 | 6.3 | 6.5 |
| 2nd qtr | 166,000 | 373,300 | 63,400 | 707,000 | 5.9 | 5.6 |

## INDEX OF TOTAL EMPLOYMENT, ARKANSAS and UNITED STATES

Quarterly data, seasonally adjusted, 1957-59 = 100




(Semi-logarithmic scale: equal slopes indicate equal rates of change)

### Quarterly Change in Total Employment

Seasonally adjusted, percent

| | 1957-59 to 2ndqtr 1971 | 2nd qtr 1970 to 3rd qtr 1970 | 3rd qtr 1970 to 4th qtr 1970 | 4th qtr 1970 to 1st qtr 1971 | 1st qtr 1971 to 2nd qtr 1971 |
|---|---|---|---|---|---|
| Arkansas | + 27.2 | - 0.4 | + 0.3 | + 2.1 | - 0.9 |
| United States | + 21.0 | + 0.0 | + 0.1 | + 0.0 | + 1.0 |

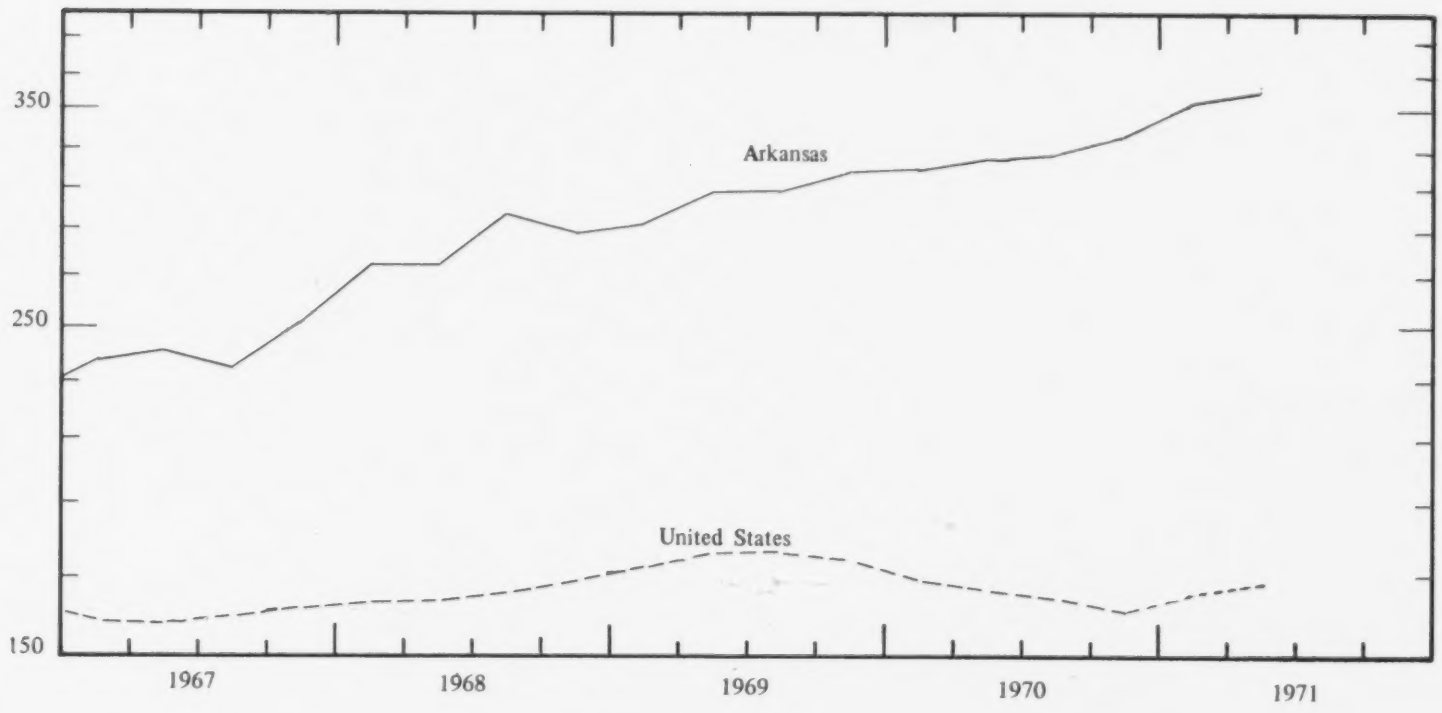
## EMPLOYMENT BY MAJOR INDUSTRY GROUP IN ARKANSAS, and UNEMPLOYMENT, ARKANSAS AND UNITED STATES

Seasonally adjusted

| TIME PERIOD | EMPLOYMENT | | | | UNEMPLOYMENT RATE | |
|---|---|---|---|---|---|---|
| | Wages and Salaries | | Agricultural | Total Employment | Arkansas | United States |
| | Manufacturing | Nonmanufacturing | | | | |
| 1962 | 113,200 | 283,500 | 83,500 | 595,300 | 5.9 | 5.5 |
| 1963 | 119,400 | 295,500 | 80,500 | 611,300 | 5.1 | 5.7 |
| 1964 | 125,400 | 303,600 | 70,700 | 616,600 | 5.5 | 5.2 |
| 1965 | 134,200 | 321,100 | 65,100 | 638,400 | 5.1 | 4.5 |
| 1966 | 147,900 | 337,500 | 54,200 | 646,500 | 4.4 | 3.8 |
| 1967 | 153,300 | 345,200 | 56,200 | 659,000 | 4.5 | 3.8 |
| 1968 | 159,100 | 358,800 | 58,900 | 674,100 | 4.3 | 3.6 |
| 1969 | 164,700 | 363,600 | 62,300 | 693,300 | 4.2 | 3.5 |
| 1970 | 165,300 | 367,200 | 57,900 | 693,700 | 5.2 | 4.9 |
| 2nd qtr | 165,600 | 366,700 | 59,900 | 691,800 | 5.1 | 4.9 |
| 3rd qtr | 163,900 | 364,000 | 56,800 | 689,000 | 5.5 | 5.2 |
| 4th qtr | 162,500 | 368,500 | 53,900 | 691,000 | 5.6 | 5.8 |
| 1971 | | | | | | |
| 1st qtr | 165,900 | 372,200 | 67,200 | 705,600 | 5.6 | 5.9 |
| 2nd qtr | 166,100 | 371,100 | 57,600 | 698,900 | 5.4 | 6.0 |

## INDEX OF VALUE ADDED BY MANUFACTURE, ARKANSAS, and INDEX OF MANUFACTURING PRODUCTION, UNITED STATES

Quarterly data, seasonally adjusted, 1957-59 = 100




(Semi-logarithmic scale: equal slopes indicate equal rates of change)

### Quarterly Change in Manfacturing

Seasonally adjusted, percent

| | 1957-59 to 2nd qtr 1971 | 2nd qtr 1970 to 3rd qtr 1970 | 3rd qtr 1970 to 4th qtr 1970 | 4th qtr 1970 to 1st qtr 1971 | 1st qtr 1971 to 2nd qtr 1971 |
|---|---|---|---|---|---|
| Arkansas | + 257.6 | + 0.7 | + 3.0 | + 4.8 | + 4.9 |
| United States | + 66.9 | - 1.3 | - 4.0 | + 1.9 | + 2.4 |

### ARKANSAS VALUE ADDED BY MANUFACTURE

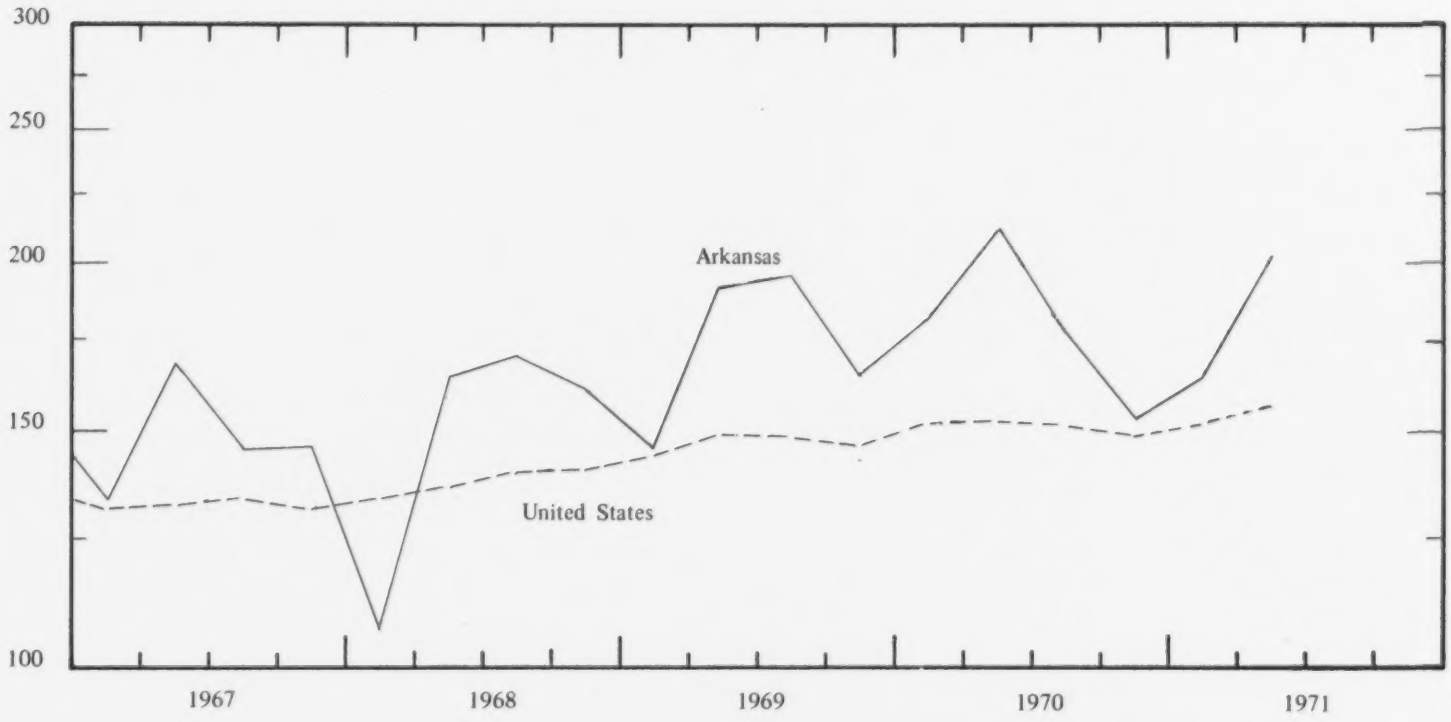
Millions of dollars

| | Seasonally Adjusted | | | | | | | | Not Seasonally Adjusted |
|---|---|---|---|---|---|---|---|---|---|
| Quarter | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | 1971 |
| Jan-Mar | 270.5 | 282.6 | 334.1 | 388.4 | 451.4 | 472.2 | 521.7 | 578.9 | 527.4 |
| Apr-Jun | 263.8 | 298.3 | 352.3 | 391.2 | 450.1 | 500.5 | 532.5 | 581.8 | 580.0 |
| Jul-Sep | 273.0 | 310.8 | 361.8 | 379.3 | 487.9 | 502.6 | 536.1 | | |
| Oct-Dec | 281.2 | 324.7 | 361.6 | 409.1 | 471.0 | 516.3 | 552.3 | | |
| Annual | 1,088.5 | 1,216.4 | 1,409.8 | 1,568.0 | 1,860.4 | 1,991.6 | 2,142.6 | | |

## INDEX OF CASH RECEIPTS FROM FARM MARKETINGS

### ARKANSAS and UNITED STATES

Quarterly data, seasonally adjusted, 1957-59 = 100




(Semi-logarithmic scale: equal slopes indicate equal rates of change)

### Quarterly Change in Cash Receipts

Seasonally adjusted, percent

| | 1957-59 to 2nd qtr 1971 | 2nd qtr 1970 to 3rd qtr 1970 | 3rd qtr 1970 to 4th qtr 1970 | 4th qtr 1970 to 1st qtr 1971 | 1st qtr 1971 to 2nd qtr 1971 |
|---|---|---|---|---|---|
| Arkansas | + 101.0 | - 16.4 | - 14.5 | + 11.6 | + 19.4 |
| United States | + 57.1 | - 0.4 | - 1.7 | + 1.6 | + 1.8 |

## ARKANSAS CASH RECEIPTS FROM FARM MARKETINGS

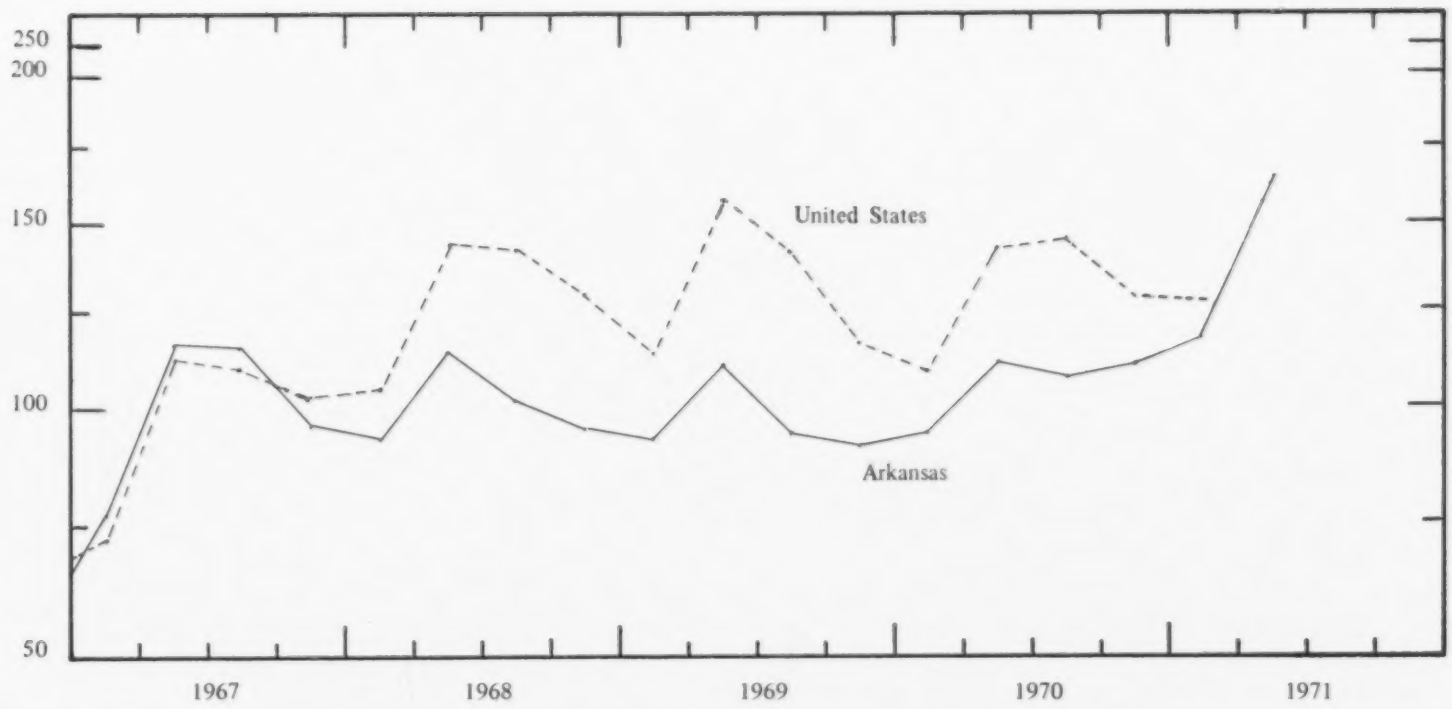
Thousands of dollars

| | Seasonally Adjusted | | | | | | | | Not Seasonally Adjusted |
|---|---|---|---|---|---|---|---|---|---|
| Quarter | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | 1971 |
| Jan-Mar | 216,629 | 226,930 | 287,175 | 208,932 | 184,826 | 227,876 | 283,320 | 262,963 | 164,109 |
| Apr-Jun | 212,955 | 225,139 | 266,391 | 266,838 | 261,047 | 295,456 | 329,551 | 313,908 | 170,548 |
| Jul-Sep | 202,985 | 218,920 | 220,569 | 225,190 | 268,278 | 302,076 | 275,555 | | |
| Oct-Dec | 236,524 | 231,381 | 239,268 | 225,733 | 253,560 | 257,233 | 235,558 | | |
| Annual | 869,093 | 902,370 | 1,013,403 | 926,693 | 964,711 | 1,086,641 | 1,123,984 | | |

## INDEX OF RESIDENTIAL CONSTRUCTION CONTRACTS

## ARKANSAS and UNITED STATES

Quarterly data, not seasonally adjusted




(Semi-logarithmic scale: equal slopes indicate equal rates of change)

## QUARTERLY CHANGE IN RESIDENTIAL CONSTRUCTION

Not seasonally adjusted, percent

| | 2nd qtr 1970 to 3rd qtr 1970 | 3rd qtr 1970 to 4th qtr 1970 | 4th qtr 1970 to 1st qtr 1971 | 1st qtr 1971 to 2nd qtr 1971 |
|---|---|---|---|---|
| Arkansas | - 7.5 | + 3.7 | + 5.6 | + 37.6 |
| United States | + 3.9 | - 8.5 | - 0.3 | N.A. |

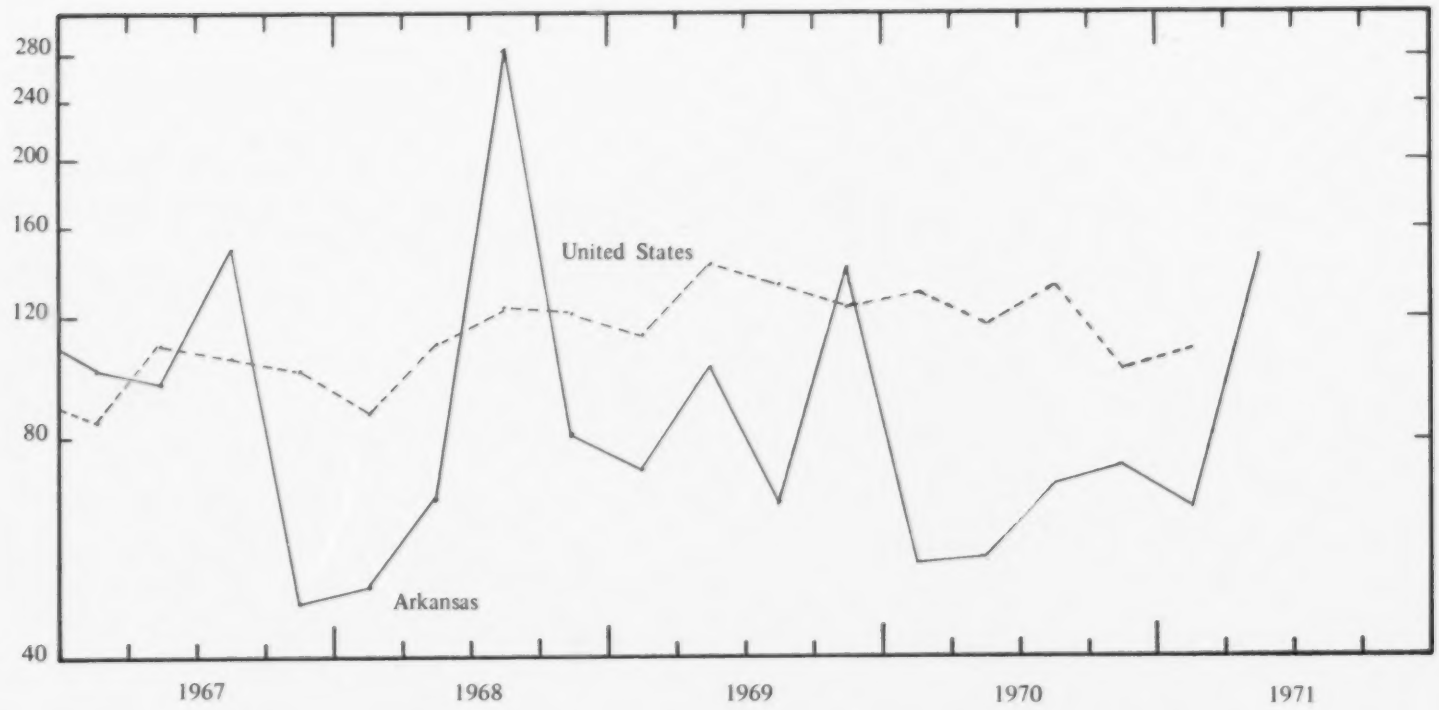
## ARKANSAS RESIDENTIAL CONSTRUCTION CONTRACTS

Thousands of dollars

| | Seasonally Adjusted | | | | | | | Not Seasonally Adjusted |
|---|---|---|---|---|---|---|---|---|
| Quarter | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | 1971 |
| Jan-Mar | 60,672 | 57,437 | 45,386 | 55,112 | 56,967 | 54,023 | 70,885 | 64,149 |
| Apr-Jun | 63,064 | 56,730 | 54,308 | 54,154 | 52,281 | 55,336 | 77 081 | 88,265 |
| Jul-Sep | 56,909 | 44,312 | 56,151 | 50,043 | 45,630 | 53,066 | | |
| Oct-Dec | 69,200 | 36,664 | 59,180 | 61,572 | 54,302 | 71,500 | | |
| Annual | 249,845 | 195,143 | 215,025 | 220,881 | 209,180 | 233,925 | | |

## INDEX OF NONRESIDENTIAL CONSTRUCTION CONTRACTS

Quarterly data, not seasonally adjusted




(Semi-logarithmic scale: equal slopes indicate equal rates of change)

### Quarterly Change in Nonresidential Construction Contracts

Not seasonally adjusted, percent

| | 2nd qtr 1970 to 3rd qtr 1970 | 3rd qtr 1970 to 4th qtr 1970 | 4th qtr 1970 to 1st qtr 1971 | 1st qtr 1971 to 2nd qtr 1971 |
|---|---|---|---|---|
| Arkansas | + 26.3 | + 4.6 | - 11.3 | + 114.1 |
| United States | + 11.0 | - 22.0 | + 4.6 | N.A. |

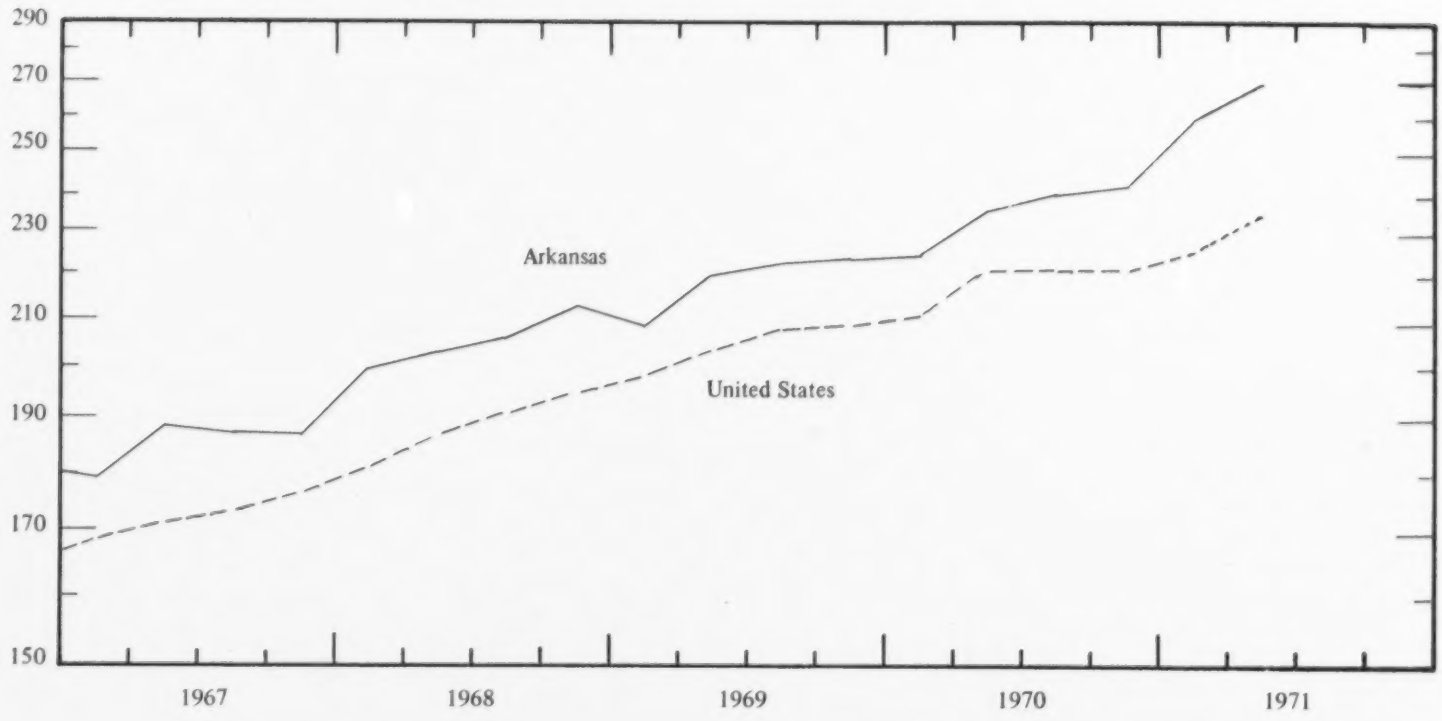
## ARKANSAS NONRESIDENTIAL CONSTRUCTION CONTRACTS

Thousands of dollars, not seasonally adjusted

| Quarter | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 |
|---|---|---|---|---|---|---|---|---|
| Jan-Mar | 23,465 | 31,192 | 38,245 | 37,019 | 18,490 | 26,153 | 20,763 | 24,546 |
| Apr-Jun | 25,336 | 43,520 | 38,500 | 35,020 | 24,491 | 46,392 | 20,943 | 52,512 |
| Jul-Sep | 36,739 | 30,085 | 32,876 | 54,557 | 103,169 | 22,528 | 26,449 | |
| Oct-Dec | 20,836 | 26,196 | 44,004 | 17,474 | 29,600 | 49,782 | 27,667 | |
| Annual | 106,376 | 130,993 | 153,625 | 144,070 | 175,750 | 144,855 | 95,822 | |

## INDEX OF PERSONAL INCOME, ARKANSAS AND UNITED STATES

Quarterly data, seasonally adjusted, 1957-59 = 100




(Semi-logarithmic scale: equal slopes indicate equal rates of change)

### Quarterly Change in Personal Income

Seasonally adjusted, percent

| | 1957-59 to 2nd qtr 1971 | 2nd qtr 1970 to 3rd qtr 1970 | 3rd qtr 1970 to 4th qtr 1970 | 4th qtr 1970 to 1st qtr 1971 | 1st qtr 1971 to 2nd qtr 1971 |
|---|---|---|---|---|---|
| Arkansas | + 169.8 | + 1.2 | + 0.4 | + 7.8 | + 3.9 |
| United States | + 134.1 | + 0.7 | + 0.8 | + 2.2 | + 2.8 |

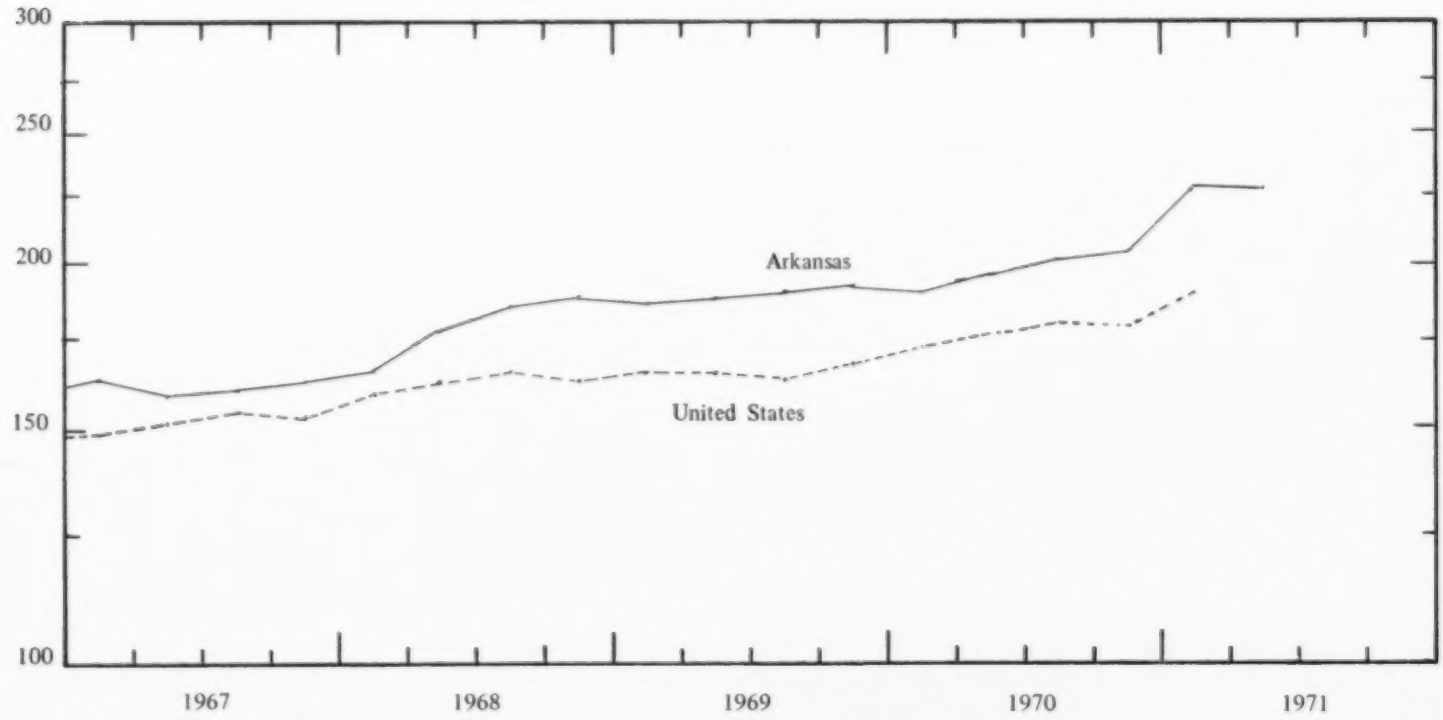
## ARKANSAS PERSONAL INCOME

Millions of dollars, seasonally adjusted

| Quarter | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan-Mar | 646 | 694 | 753 | 825 | 866 | 1,017 | 1,026 | 1,071 | 1,218 | 1,261 | 1,455 |
| Apr-Jun | 664 | 772 | 768 | 841 | 883 | 989 | 1,061 | 1,148 | 1,242 | 1,329 | 1,510 |
| Jul-Sep | 668 | 731 | 784 | 852 | 903 | 983 | 1,064 | 1,197 | 1,256 | 1,345 | |
| Oct-Dec | 723 | 751 | 798 | 868 | 926 | 1,008 | 1,076 | 1,196 | 1,247 | 1,350 | |
| Annual | 2,701 | 2,898 | 3,103 | 3,386 | 3,578 | 3,997 | 4,227 | 4,612 | 4,963 | 5,285 | |

## INDEX OF RETAIL SALES, ARKANSAS and UNITED STATES

Quarterly data, seasonally adjusted, 1957 - 59 = 100




(Semi-logarithmic scale: equal slopes indicate equal rates of change)

## Quarterly Change in Retail Sales

Seasonally adjusted, percent

| | 2nd qtr 1970 to 3rd qtr 1970 | 3rd qtr 1970 to 4th qtr 1970 | 4th qtr 1970 to 1st qtr 1971 | 1st qtr 1971 to 2nd qtr 1971 |
|---|---|---|---|---|
| Arkansas | + 2.5 | + 0.5 | + 9.0 | - 0.9 |
| United States | + 1.1 | - 1.4 | + 4.2 | N.A. |

## ARKANSAS ESTIMATED RETAIL SALES

Thousands of dollars

| | Seasonally Adjusted | | | | | | | | Not Seasonally Adjusted |
|---|---|---|---|---|---|---|---|---|---|
| Quarter | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | 1971 |
| Jan - Mar | 544,194 | 541,587 | 614,164 | 638,803 | 655,152 | 722,579 | 740,780 | 883,200 | 805,540 |
| Apr - Jun | 532,175 | 562,357 | 598,809 | 623,706 | 682,485 | 735,892 | 786,661 | 874,970 | 929,250 |
| Jul - Sep | 531,225 | 571,665 | 604,429 | 626,006 | 709,436 | 758,834 | 806,181 | | |
| Oct - Dec | 522,396 | 571,360 | 619,618 | 642,014 | 729,736 | 768,736 | 810,192 | | |
| Annual | 2,129,990 | 2,246,969 | 2,437,020 | 2,530,529 | 2,776,809 | 2,985,980 | 3,143,814 | | |

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